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Population:
A Lively Introduction

by Joseph A. McFalls, Jr.

Abstract—The study of demography must begin with an understanding of the three sources of population changes: fertility, mortality, and migration. This *Bulletin* leads prospective demographers—or anyone interested in population—through the dynamics of these three variables, introducing them to the forces that cause populations to grow or decline, and that determine the age, sex, or ethnic composition of a society. The author also examines the role of fertility, mortality, and migration in changing the geographic distribution of people in the world and in the United States.

The author summarizes the unprecedented global population growth that has occurred within the past few centuries as well as the prospects for future growth. And, he surveys the many critical population-related issues facing the world today.

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Population: A Lively Introduction

by Joseph A. McFalls, Jr.

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> *The study of population offers something for everyone: the daily dramas of sex and death, politics and war; the interlacings of individuals in all their collectivities; the confrontations of nature and civilization, [of] statistics and diaries, [of] self-interest and altruism.*[1]
>
> *—Samuel H. Preston*

Most people think demography is just math in disguise—a sort of dry social accounting. Once exposed to the subject many change their minds. They come to appreciate the profound impact demographic forces have on societies. This has never been more true than during the past half-century, a period in which the United States and other societies have experienced unprecedented social and demographic change. Since these demographic forces have not been stilled, they will continue to cause social change and to shape social programs for the balance of our lives and beyond.

People also find demography fascinating because it deals with so many personally relevant topics. Nearly all the major events of people's lives have demographic implications: birth, schooling, marriage, occupation, childbearing, retirement, and death. Consider the following questions:

- When and where were you born? How many others were born the same year?
- What is your probability of getting married or divorced?
- Do you have children or do you ever plan to? How many, and how far apart?
- How many jobs will you have? What kind? What are your chances of promotion? When will you retire?
- How many times will you move? Where are you likely to go?
- How long will you live? What are the chances of your dying within a year? Within ten years? What is likely to kill you?

These are all in part demographic questions. Indeed, if people are not interested in demographic phenomena, they are not interested in themselves.

Demography or population studies is at one and the same time a discipline, an "interdiscipline," and a subdiscipline. It is clearly a discipline because it is a field with its own body of interrelated concepts, techniques, journals, departments, and professional associations. Demography is also an interdisciplinary field because it draws its subject matter and methods from many disciplines including sociology, economics, biology, geography, history, and the health sciences. Finally, demography also is considered a subdiscipline within some of these same major disciplines. In most universities, demography programs are housed within the sociology department, perhaps because population phenomena have so long been linked to social causes and consequences.[2]

Demography is defined as the study of human populations: their size, composition, and distribution, as well as the causes and consequences of changes in these factors. Populations are never static, they grow or decline through the interplay of three demographic processes: births, deaths, and migration. If some groups within a population grow or decline faster than others, the composition of the whole is altered.

This *Bulletin* presents the basic what, why, and how of the study of demography. It is not a comprehensive treatment of the subject, but provides an overview of demographic processes and the basic measures used to assess them. In addition, it traces population trends in the world and the United States, surveys the demographic differences among population groups, and examines broad social issues linked to population change.

The first three sections of the monograph provide the framework for studying the dynamics of population. Fertility, mortality, and migration are at the root of all demographic change. The fourth section of the *Bulletin* reveals how changes in fertility, mortality, and migration affect a population's size and growth rate, and how population projections are calculated. The fifth section delves into the composition of populations according to common variables: age, sex, and race or ethnicity. The sixth section describes how the geographic distribution of populations change, primarily through migration. The final sections discuss issues and problems associated with population growth.

Fertility

The study of population dynamics must begin with fertility. Fertility refers to the number of births that occur to an individual or in a population. In 1990, fertility rates of national populations ranged from an average of 1.3 children per woman in Italy to 8.1 children per woman in Rwanda. The average for the United States was 2.1 and for the world, 3.6. On an aggregate basis, over 4 million babies were born in the United States in 1990, and about 24 million in China. Worldwide, 143 million new human beings were born in 1990, about 272 per minute.

Fertility must be distinguished from its sister term, **fecundity,** which refers to the physiological ability of individuals or couples to have children. Some individuals are infecund–unable to bear children because of disease or genetic dysfunction. Others are superfecund. The world record for high fecundity is held by a 19th century Russian woman who reputedly produced 69 children in 27 pregnancies.[3] This claim is suspect, but there is documented evidence of women giving birth to 30 children. Thus, for individuals, fecundity may range from zero to about 30 children.

The maximum fecundity of a population, which is composed of individuals with varying levels of fecundity, is thought to be about 15 children per woman.[4] This is the theoretical maximum number of children a population of women could produce if they engaged in regular sexual intercourse from menarche, at around age 12, until they reached menopause, at around age 50, and never used any form of birth control.[5]

The theoretical maximum of 15 children is a far cry from real life levels. Even in the world's highest fertility countries the average rarely exceeds eight children per woman.

The maximum fecundity of a population, which is composed of individuals with varying levels of fecundity, is thought to be about 15 children per woman.

What accounts for this large gap? In every society a variety of cultural, economic, and health factors interfere with the process of human reproduction. These factors include cultural values regarding childbearing (does the society value large or small families?); social roles (is the wife primarily a childbearer and childrearer?); economic realities (do parents rely on children to look after them in old age?); and the prevalence of diseases, like gonorrhea, that impair fecundity.

Box 1

The Intermediate Variables that Affect Fertility

1. Fecundity
   - ability to have intercourse
   - ability to conceive
   - ability to carry a pregnancy to term

2. Sexual Unions*
   the formation and dissolution of unions
   - age at first intercourse
   - proportion of women who are in a union
   - time spent outside a union (for example, separated, divorced or widowed)

   intercourse within sexual unions
   - frequency of sexual intercourse
   - sexual abstinence (for example, for religious reasons)
   - temporary separations (for example, for military service)

3. Birth Control
   - use of contraceptives
   - contraceptive sterilization
   - induced abortion

*Ranging from casual relationships to legal marriage

References

Kingsley Davis and Judith Blake "Social Structure and Fertility: An Analytic Framework," *Economic Development and Cultural Change* vol. 4, no. 3 (April 1956); and Joseph A. McFalls, Jr. and Marguerite McFalls, *Disease and Fertility* (New York: Academic Press, 1984).

Most of these factors do not affect fertility directly; they influence another set of variables that determine the rate and level of childbearing. In 1956, demographers Kingsley Davis and Judith Blake isolated the factors that control the probability that a woman of reproductive age (roughly ages 15 to 49) will become pregnant and produce a child. The classic list of factors identified by Davis and Blake were labeled the "intermediate variables" that determine a society's fertility level. A modified list of these variables is given in Box 1, arranged according to whether they affect (1) fecundity, (2) marriage, or (3) birth control. These factors operate in every society, but the relative importance of each varies tremendously.

In 1982, demographer John Bongaarts published a landmark article demonstrating that four of these variables explain nearly all the variation in fertility levels among populations. These four "proximate determinants of fertility," as he termed them, could be quantified and expressed as a simple formula, creating a versatile method for statistical analysis. The four proximate determinants are (1) the proportion married, (2) the percent of women using contraception, (3) the proportion of women who are infecund (primarily due to breastfeeding), and (4) the level of abortion. West Germany, for example, achieved the lowest fertility rate on record for a nation—1.28 births per woman in 1985—in large part because of relatively high rates of contraception and a low rate of marriage among women in their prime childbearing years. Conversely, the Hutterites, a North American religious sect, averaged 12 children per woman in the 1930s—the highest fertility on record for any population—by promoting early and universal marriage and eschewing contraception and abortion.[6]

WORLD BANK

While Bongaart's variables construct a valuable framework for analyzing fertility differences, they gloss over the cultural and biological mechanisms that affect fertility in all societies. In many African countries today, women marry young and rarely use contraceptives, yet fertility is kept to a six or seven-child average through cultural factors. Cultural practices such as prolonged sexual abstinence after childbirth (often up to two years) and the breastfeeding of babies until age two or three, prolongs the infecund period following childbirth. African husbands often work away from home for months at a time which further reduces the time wives are exposed to the risk of pregnancy. In certain West and Central African countries, a high prevalence of sexually transmitted disease has caused infecundity in one-seventh to one-third of the women of childbearing age.[7]

Measuring Fertility

The fertility rates discussed above, except for the 12-child Hutterite average, are **total fertility rates (TFRs).** The TFR is a commonly used rate because it is easy to visualize what it stands for–the average number of children in a family. But the TFR is a synthetic rate; it does not measure the fertility of any real group of women. It measures the fertility of an imaginary group of women who pass through their fictitious reproductive lives subject to the rates of childbearing experienced by real women in a given year. Although the TFR concept is not intuitively obvious, it is actually straight-forward and it is easy to calculate from age-specific birth rates (see Box 2).

Another attraction of the TFR is that is allows us to explore the concept of replacement level fertility.

Box 2

Demographic Measures

Demographers use a variety of rates and other statistics to describe populations. In addition, they differentiate **crude** from **refined** and **adjusted** rates. What do these measures really mean?

A **rate** shows the frequency of a demographic event in a population during a specific time period. For example, the United States recorded 8.6 deaths per 1,000 persons in 1990. The U.S. death rate is calculated from the number of deaths during 1990 and the total U.S. population for that year.

But this is the crude death rate. Its value is affected by the composition of the population--in particular the age structure. Because age composition varies over time and among populations, it is difficult to use the crude rate to track changes in mortality or to compare U.S. mortality with that of other countries.

One way to minimize the effects of age structure on crude rates is to calculate separate rates for each age group. In the case of fertility rates, age-specific birth rates usually are calculated for each five-year age group of women between the ages of 15 and 49 (or sometimes age 44). To obtain the age-specific birth rate for women age 20 to 24, for example, the number of births that occurred to women age 20 to 24 in a given year is divided by the total number of women in that age group (see table).

Age-specific rates may be calculated for deaths, migration, marriage, college attendance, migration, or any other variable. Similarly rates may be calculated separately for women with specific characteristics, such as birth rates for married women only. Death rates may be calculated separately for each cause of death as shown in Table 1, page 11. Such cause-specific rates can indicate which diseases claim the most lives.

Age-specific rates often are used to calculate summary measures, such as the TFR, or to adjust a crude rate so that the age differences are minimized. The U.S. National Center for Health Statistics and many other national statistical agencies regularly publish death rates adjusted for age to facilitate comparisons among population groups and over time.

Users of demographic data need to recognize the difference between crude and refined or adjusted rates and to learn when it is appropriate to use a given measure.

Calculating the U.S. Total Fertility Rate (TFR), 1988

Age of Women	(1) Number of Women	(2) Births to Women in Age group	(3) Age-specific Birth rate (2) ÷ (1)
15-19	8,890,000	488,941	.055
20-24	9,574,000	1,067,472	.111
25-29	10,928,000	1,239,256	.113
30-34	10,903,000	803,547	.074
35-39	9,660,000	269,518	.028
40-44	8,155,900	40,776	.005
		Sum	.386
		TFR=Sum × 5	1.93

Source: Arthur Haupt and Thomas Kane, *Population Handbook*, 3rd. Edition. (Washington, DC: Population Reference Bureau, 1991)

This is the level of childbearing at which couples have an average of two children (a TFR of 2.0)—thus just replacing themselves in the population. A population with replacement level fertility eventually will stop growing (this is discussed more fully in the section on population growth). Actually, replacement level fertility requires a TFR slightly above 2.0, usually about 2.1 to 2.2, primarily because some children will die before they grow up to have their own two children.

The **crude birth rate** is the most easily obtained and most often reported fertility measure. It is calculated from the number of babies born in a given year (or any other time period) divided by the mid-year population, and is expressed as the number of births per 1,000 population. In 1990, the U.S. birth rate was 17 births per 1,000. For the world, the rate was about 27 per 1,000.

As the name implies, this rate is considered a crude measure of a society's childbearing patterns. This is because fertility is so heavily affected by the sex and particularly by the age composition of a population. Younger women have higher birth rates than older women, thus a female population consisting primarily of young women will produce more births than a population made up of older women. More refined rates attempt to minimize the effects of age structure. In addition to the TFR, these include the **general fertility rate,** which measures the number of births per woman of childbearing age (ages 15 to 49), and the **net reproduction rate,** which measures the number of daughters born per woman who are likely to live to adulthood.[8] These rates allow demographers to compare more accurately the fertility of different countries. Of these rates, only the TFR and crude birth rate are used in this *Bulletin*.

Lifetime fertility: cohort rates

What if we want to measure the fertility of a certain group of women, for example, women born between 1940 and 1945? For women who are past their reproductive years, say above age 50, a **completed fertility rate** can be estimated by determining the average number of children they bore from the time they experienced menarche in their early teens until menopause. Completed fertility is a useful measure for comparing the fertility levels of different generations. In the United States, women born between 1906 and 1910 (the 1906-1910 birth cohort) produced what was then the smallest number of children in U.S. history, an average of 2.2 children per woman. The 1931-1935 cohort, who became parents during the baby boom, produced the largest number–a completed fertility rate of 3.2 children per woman. Baby boomers—Americans born between 1946 and 1964—may well average fewer children than the 1906-1910 cohort, but because they have yet to complete their childbearing years, we cannot measure their completed fertility.

Completed fertility is a cohort measure because it describes the fertility of a specific cohort of women. The TFR and crude birth rate are **period** rates because they measure fertility for a given period of time. Cohort rates tell us nothing about current fertility. Likewise, period rates, like the TFR for 1988, cannot predict future fertility. We do not know what the completed fertility of women who were age 20 to 24 in 1988 will be by the time they reach menopause around 2020. The difference between cohort and period rates explain how it is possible that, during the height of the U.S. baby boom (1957) the TFR reached 3.7 children per woman, yet no cohort of women born in the 20th century has recorded a completed fertility rate above 3.2 children.

The TFR and crude birth rate are period rates because they measure fertility for a given period of time.

Fertility in the United States

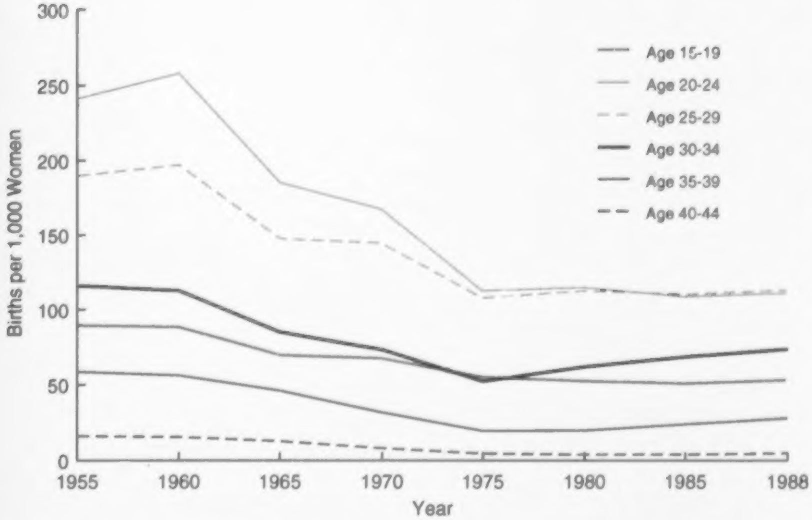
American women averaged more than seven children each until the early decades of the 19th century. Average fertility declined gradually thereafter, interrupted only by the baby boom following World War II. The TFR reached an all time low of 1.74 children in 1976, and it has remained relatively low ever since. By 1990, the TFR had edged up to a 2.1-child average. The baby bust came about in large part because of a postponement of marriage and because of the widespread use of contraception and abortion. Judging by the long-term fertility trend and the current social trends favoring low fertility, birth rates are likely to remain low.[9]

Despite the fact that few American women believe childless or one-child families are ideal, many women have delayed marriage and childbearing so long that they will have only one child or no children at all.[10] Some 16 percent of American women who were ages 40 to 44 in 1990 had never had children, and most of these women never will.

Fertility Differentials

Although the overall fertility rate in the United States has remained fairly stable since the 1970s, there is considerable variation among individual couples. Among all women of reproductive age (roughly ages 15 to 44), only 23 percent conform to the two-child average. Forty-two percent have not yet had any children, and 2 percent have had five or more children. What accounts for these differences? The most predictable and obvious explanation of fertility differentials is age, but income, race, religion, and many other social, economic, and cultural factors influence childbearing.

Figure 1
U.S. Birth Rates by Age of Mother, 1955-1988



Source: National Center for Health Statistics.

Age

Women are able to conceive a pregnancy beginning in their early teens and ending in their late 40s. Over this roughly 30-year span, birth rates vary substantially by age (see Figure 1). Since 1983, U.S. women ages 25 to 29 have had the highest birth rates, slightly higher than women ages 20 to 24, the previous leaders. Another age-related phenomenon can be discerned in Figure 1. Childbearing among women age 30 to 44 reversed its steep decline and turned up during the late 1970s and 1980s. Many of these older mothers began to have the children they had postposted earlier in life. Finally, Figure 1 reveals that the rate of teenage childbearing has remained relatively low over the last two decades, despite the fact that teens have become sexually active at younger ages.[11]

The birth rates by the age of mother follow the same general pattern in most societies—rates are low in the teens, peak in the twenties, and decline thereafter. But comparisons of the age-specific rates in different countries reveal significant variations, as shown in Figure 2. In Japan, where the 1988 TFR was 1.7, there is a remarkable concentration of childbearing among women 25 to 29 years of age. These women produce nearly one-half of all Japanese births. In the United States, birth rates also are highest for women 25 to 29 years of age, but they account for just under 30 percent of all births. In the West African country of Ghana, where the TFR was an estimated 6.4 in 1988, birth rates rise very gradually from the teens to a peak in the late-20s and then decline slowly into the 40s. At every age, Ghanaian women have higher birth rates than American and Japanese women.

Race and Ethnicity

In many countries, racial and ethnic minorities have higher fertility than majority groups. Often these differences arise from religious beliefs and cultural traditions, but, they also are linked to the lower economic status of minority groups and the number of years they have lived in their adopted country. As immigrant groups assimilate socially and economically, they tend to adopt the fertility patterns of the majority. In the United States, for example, fertility differences among white ethnic groups (Irish, German, or Italian Americans, for example) are becoming less distinguishable over time.[12]

Groups that have not fully "assimilated" may maintain their distinctive fertility patterns. In the United States, Hispanics, African Americans, and American Indians have higher fertility than the white, non-Hispanic majority.

In 1988, the TFR was 1.8 for white women and 2.4 for black women. The TFR for Hispanic women was about 2.6 in the 1980s. Asian Americans tend to have rates close to non-Hispanic whites.[13]

Arabs in Israel, Asians in the Soviet Union, and Turks in Germany are other examples of ethnic groups whose fertility has remained higher than the national average.

Socioeconomic Status

In nearly every contemporary society, the poor have more children than the rich. This is also true for the United States within all major racial and ethnic groups. In general, fertility goes down as the income and educational attainment of women increase. In 1988, for example, women 35 to 44 years old with five or more years of college averaged 1.6 births compared with 2.3 births for women who completed high school only, and nearly three births for non-high school graduates.[14]

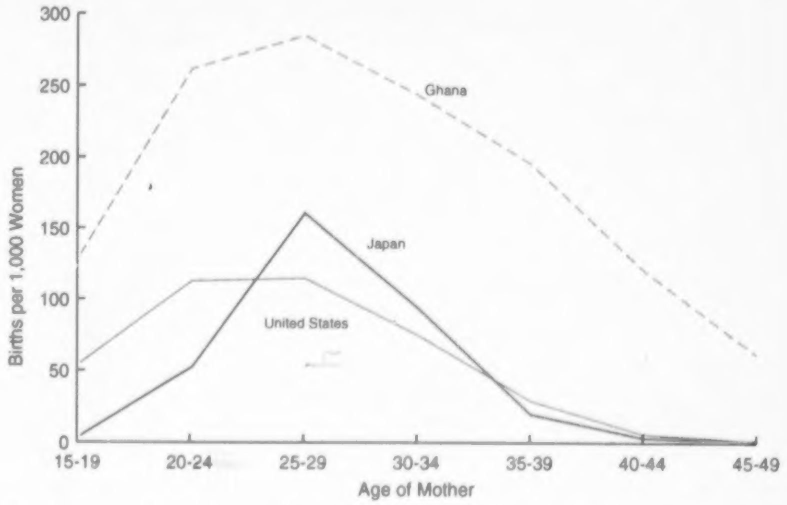
Other Differentials

Numerous other social, religious, and cultural factors are associated with fertility differences. Most of these can be explained by the age, income, or education differences among these groups.

In just about every culture, women who work outside the home have fewer children than those who do not, and rural women have more children than urbanites. People who actively practice a religion tend to have higher fertility than non-religious people. There are long-standing differences between major religious groups in many countries, but these often are intertwined with ethnic and socioeconomic differences.[15]

Figure 2

Age Patterns of Fertility: United States, Japan, and Ghana, 1988



Source: National Center for Health Statistics (U.S.); Institute of Population Problems (Japan); and the Ghana Demographic and Health Survey.

Mortality

Mortality, the counterpoint to fertility, is the second cause of population change. The death rate for a population is usually expressed as the number of deaths per 1,000 persons in a given year. In 1990, 2.2 million Americans died, producing a U.S. death rate of 9 deaths per 1,000 persons. Throughout the world, 50 million people died that same year, also 9 deaths per 1,000. Worldwide, death rates range from only 3 or 4 in Costa Rica and Jordan, for example, to the low 20s in Ethiopia, Mali, and a few other African countries.

The death rate measures the proportion of a population that dies each year, but comparing death rates among populations does not show

Mortality, the counterpoint to fertility, is the second cause of population change.

Life expectancy reflects the real life conditions in a population while life span is a theoretical maximum based on the premise that humans have a genetic clock that eventually orders the body to shut down after a certain age.

whether one population is healthier or more long-lived than another. This is because the death rate is strongly influenced by the age structure of the population. Death rates often are higher in developed countries such as Denmark than in third world countries such as Mexico, even though developed countries tend to have healthier environments and better medical services. A large proportion of the population of developed countries is in the older ages—the ages at which most deaths occur—while a relatively small proportion of the population of developing countries is in the older ages. Nearly 40 percent of the population of Mexico is under age 15, when fewer deaths occur, and only 4 percent is age 65 or older. In contrast, only 17 percent of Danes are under age 15, and 16 percent are age 65 or older.

Life Expectancy

To better gauge the life chances of individuals in a population as well as to better compare mortality conditions among countries, we must look at the average **life expectancy.** Both biological and social factors influence how long individuals live, and by extension, the average life expectancy within a population. In 1990, the average life expectancy at birth in the United States was 75 years. The world's highest life expectancy was in Japan, at 79 years. The lowest life expectancy estimates were for the West African countries of Sierra Leone, Guinea, and Guinea-Bissau, at about 42 years.

Life expectancy is a concept many people use but few understand. What does the 1990 U.S. life expectancy of 75 years really mean, and to whom does it apply? The term life expectancy usually is used as a short-hand way of expressing "life expectancy at birth." Can we conclude that a child born in the United States in 1990 can be expected to live to an average age of 75? Not really. As an infant born that year proceeds through life, mortality conditions will change. There may be nuclear wars, devastating plagues, or fantastic medical advances.

Life expectancy at birth in 1990 applies to no real group, not even to real people born in 1990. Like the total fertility rate, life expectancy applies to a hypothetical group who pass through their imaginary lives subject to the death rates at each age for 1990. Age-specific death rates refer to the number of deaths of persons within a specific age group divided by the total number of people in that age group. This can also be expressed as the probability of dying at a given age. These probabilities are used to construct a life table, or actuarial table, which is used to calculate life expectancy at birth or at any other age. The U.S. life table for 1990, for example, shows that Americans in the 80 to 84 age bracket have eight additional years of life remaining, on average. Having survived the major causes of death at younger ages, these senior citizens already have demonstrated that they will live longer than the average.

Life Span

How high can life expectancy get? The upper limit is governed by the maximum **life span** for the human species. Although the two terms are often confused, life expectancy reflects the real life conditions in a population while life span is a theoretical maximum based on the premise that humans have a genetic clock that eventually orders the body to shut down after a certain age.[16] Many individuals outlive the average life expectancy for their society (13 million Americans were over age 75 in 1990), but no one can live longer than the human life span. Maximum life span, like maximum fecundity, is rarely achieved. There have been reports of Americans living as long as 137 years, and of large groups of people in the mountains of Ecuador, the Soviet Caucasuses, and Kashmir living well past 100, some even to age 150. But the very old often exaggerate their age, and the recording of birth dates and ages can be haphazard in developing countries, especially when these centenarians were born. The oldest person in the world whose age has been authenticated was just over 120 years. But experts disagree about the upper limit of human life span and about whether it is possible to push it to higher levels through medical technology or bioengineering.[17]

Only about 1 in every 100 Americans born in 1980 can expect to live beyond the age of 100 given current death rates.[18] In fact, the average life expectancy for a national population may never exceed 85 years, barring some medical breakthrough.[19]

Although many world regions still have extremely high mortality from easily curable diseases, human beings live much longer now than in the past. The average life expectancy in the world at the turn of this century was less than 30 years of age; by 1991, it was 68 years. Thus, since the origin of the human species some 2 to 5 million years ago the vast majority of progress in conquering premature mortality has taken place in the minute slice of time since 1900. Much of the increased life expectancy worldwide reflects the accumulation of knowledge about how diseases spread and consequent changes in personal hygiene and public health practices.[20]

A large share of the remaining gap in mortality between developed and developing countries can be attributed to preventable diseases that strike children particularly hard. Four causes of death—diarrhea, respiratory infections, measles, and neonatal tetanus—account for almost two-thirds of the 14 million deaths of children under age five each year.[21] Antibiotics, immunization, and clean drinking water have drastically reduced the incidence and severity of these diseases in the United States and other low-mortality countries. If adequate health services were available throughout the Third World, childhood mortality could fall quite rapidly.

Mortality in the United States

Life expectancy in the United States was age 75 in 1990, a spectacular improvement over an average life expectancy of only age 47 in 1900, but still 10 years short of the theoretical maximum of 85.

How could mortality be reduced further in the United States? We need first to look at the causes of death. Table 1 lists the 15 leading causes of death in the United States that account for about 90 percent of all deaths. Heart disease and cancer are the two biggest killers. Indeed these two diseases are in a league by themselves. They and most of the other major causes of death strike primarily after age 50 rather than during childhood. But no one is immortal. All the progress in life expectancy has, after all, only postponed death.

Table 1

The 15 Major Causes of Death: United States, 1988

Rank	Cause of death	Deaths per 100,000	Percent of all deaths	Ratio of Rates	
				Male: Female	Black: White
1	Heart disease	311	35	1.9	1.4
2	Cancer	197	22	1.5	1.3
3	Stroke	61	7	1.2	1.9
4	Accidents	40	5	2.7	1.3
5	Lung diseases	34	4	2.0	0.8
6	Pneumonia and influenza	32	4	1.7	1.4
7	Diabetes	16	2	1.1	2.4
8	Suicide	12	1	4.0	0.6
9	Liver disease	11	1	2.3	1.7
10	Kidney disease	9	1	1.5	2.8
11	Atherosclerosis	9	1	1.3	1.1
12	Homicide/Legal intervention	9	1	3.3	6.4
13	Septicemia	9	1	1.3	2.6
14	Conditions of the perinatal period	7	1	1.3	2.7
15	Human Immunodeficiency Virus (HIV)	7	1	8.6	3.4

Source: National Center for Health Statistics, *Monthly Vital Statistics Report* 39, no. 7, Supplement (November 1990).

Mortality Differentials

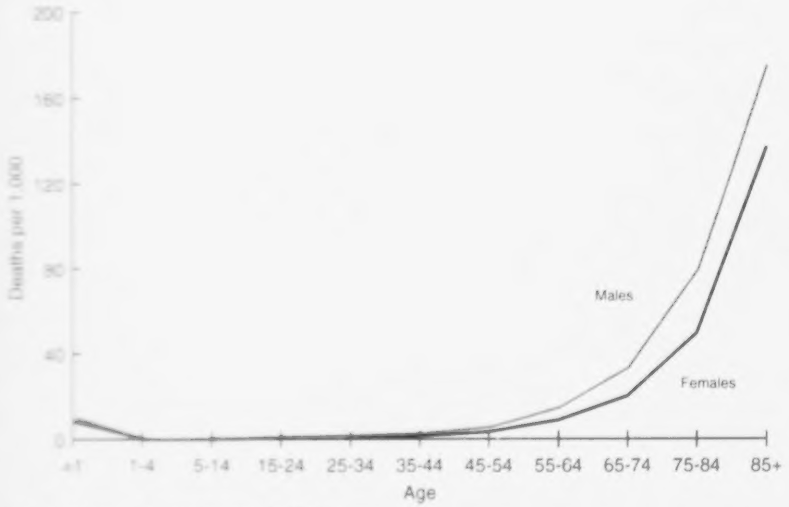
The Grim Reaper does not bring death to everyone on an equal basis. Death rates vary by everyday social categories such as age, sex, socioeconomic status, race, ethnicity, and religion. The reasons for these differentials in mortality have been examined in other publications.[22] In this *Bulletin* the emphasis is on the more demographic concerns of sheer dimension and the immediate cause of mortality.

Age

When death rates by age for the United States are plotted on a graph, they form the characteristic J- shaped curve of mortality, a pattern found in all societies, but which is most pronounced for countries with higher mortality rates (see Figure 3). The death rate is relatively high during the first year of life, declines throughout childhood and early adolescence, and then begins an inexorable climb to the towering peak of old age. From the point of view of the mythical Grim Reaper, Americans are most elusive at ages 10 and 11 when only 1 out of every 5,000 people dies, and most vulnerable at age 114 when virtually everyone is harvested.

Figure 3

U.S. Death Rates by Age, 1990



Source: National Center for Health Statistics.

Most young adults are relatively safe. Young Americans have barely a 1 percent chance of dying between ages 15 and 24. But that 1percent attrition means that 40,000 individuals in each successive group of 15-year olds never reach their 25th birthday. Most of these deaths are socially preventable. Indeed, the rank order of causes of death for 15 to 24-year-olds is very different from that shown in Table 1 for the entire population. Accidents, homicide, and suicide ranked one-two-three, and accounted for a disturbing 78 percent of all deaths to 15 to 24-year olds in 1988. Over the last three decades, the death rate for Americans as a whole has been cut in half, but that of young adults has remained about the same. Why? A dramatic rise in violent deaths among young adults has offset reductions in other causes.

Death in the first year of life, infant mortality, is an important demographic variable, and often is used as a key measure of a society's quality of life. Infant mortality in the United States has declined tremendously during the 20th century. Around 1915, 96 newborns died out of every 1,000 births. By 1990, the rate was 9 infant deaths per 1,000 births, low by world standards but still higher than most European countries.[23] In many developing countries—where health care systems are inadequate and serious infectious diseases are rampant—1 of every 10 newborn babies dies before its first birthday.

Sex

Women have lower death rates than men at every age (see Figure 3). Even before birth, fewer female than male fetuses die in the womb. The net result of this female advantage is that women live longer than men. In 1990, female life expectancy in the United States was 79 years, seven years more than that of men. About three-quarters of American centenarians are women.

The sex difference in mortality is greatest for young adults. For example, the death rate for 15 to 24-year-old males is nearly three times greater than that of their female counterparts. Notice first that all the leading causes of death in Table 1 kill males at a higher rate than females. Which causes have the highest male to female ratio? They are human immunodeficiency virus infection (AIDS), which until recently mainly struck young men; suicide, which claims four times as many male as female lives; homicide, a killer especially of young black men; and accidents, which tend to befall young men because of their risk-taking behavior. In short, the sex differential in mortality is greatest during ages 15 to 24 because the major causes of death in those ages are also the ones with the highest male to female ratio.

Socioeconomic status

Higher status individuals live healthier and longer lives than their lower status counterparts in virtually every society. The United States is no exception. All the major indexes of social status in the United States–occupation, income, and education–show a negative relationship between status and mortality.[24] In the United States, the National Longitudinal Mortality Study documented such differences in individuals who died in the early 1980s.[25] The study found that, among white men ages 25 to 64:

- Persons with low family incomes (less than $5,000 per year in 1979-81) had death rates 3.5 times higher than those with high incomes ($50,000 or more per year).
- Persons with only five to seven years of education died at 2.6 times the rate of those with four or more years of college.
- Laborers had nearly twice the death rates of professionals.

Race and Ethnicity

Racial and ethnic minorities often suffer greater premature mortality than others, usually because they are also economically disadvantaged. African Americans have always died at younger ages than whites in the United States. The gap in life expectancy between the two races was more than 15 years around 1900, and was still 6 years (76 for whites versus 70 for blacks) in 1990. Black female life expectancy was five years lower than that of white females. Similarly, black male life expectancy was seven years below that of white males (and more than 13 years less than that of white females), placing black males at the bottom of the mortality totem pole. Indeed, black males born in places such as Harlem have only a 40 percent chance of living to age 65, a rate lower than that of males in Bangladesh, one of the world's poorest countries.[26]

The biggest difference in death rates occurs between ages 25 and 44, when blacks die at more than twice the rate that whites do. In general, blacks die younger than whites because they are more vulnerable to 13 of the 15 leading causes of death shown in Table 1. Note especially the 6 to 1 black-to-white ratio in homicide. Homicide is the chief cause of death for black youths.

American Indians live about four years less than whites. Hispanics, however, have mortality rates close to U.S. national averages, despite their lower socioeconomic status. Nonimmigrant Asian Americans have a substantially longer life expectancy than white Americans, and the life expectancy of recent Asian immigrants is rapidly approaching that of the general population.[27]

Higher status individuals live healthier and longer lives than their lower status counterparts in virtually every society.

Migration

The third component of population change is migration, the movement of people into or out of a specific geographic area. Migration can add to or subtract from an area's population, depending upon whether more people move in or out. Migration usually has the greatest impact on population change in small geographic areas or where natural increase is extremely low or negative.

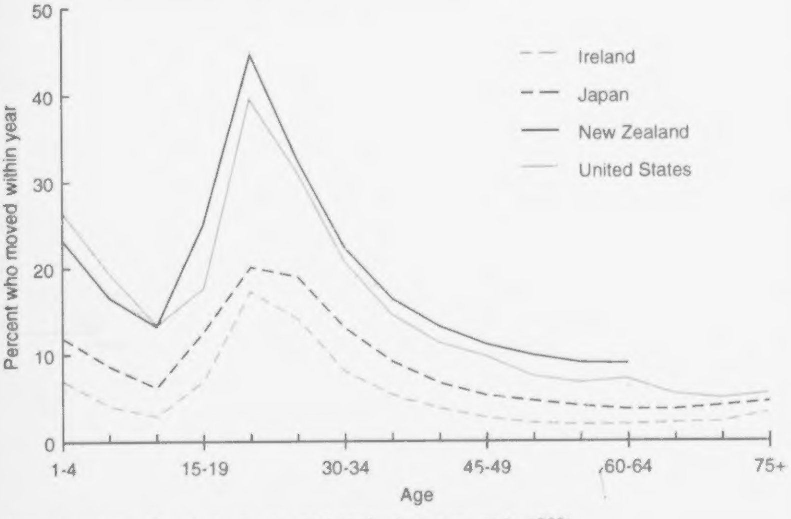
Migration is the most complex and volatile demographic variable.[28] It can occur in great waves in response to world events—such as the mass exodus from East to West Germany in 1990—or as a slow trickle. Migration is selective. Some people are much more likely to move than others. Also, migration is closely tied to the life cycle. People are most likely to move at certain stages of their lives: especially when they marry, divorce, and retire.

Migration is also more difficult to measure than fertility and mortality. Every year, millions of Americans move to a new home, but not all such residential mobility is classified as migration. Neither are temporary moves for work or leisure. Migration is the movement of people across a territorial boundary for the purpose of changing residence.

International migration involves movement across a national border, while internal migration describes moves within a country. The terms **in-migration** and **out-migration** refer to movement into or away from an area within the same country. The terms **immigration** and **emigration** refer to people moving into or out of a country. **Net migration**, the difference between the in's and out's, may be positive or negative. In the 1980s, the state of Florida had a net gain of 2.5 million people through migration, while Michigan had a net loss of 550,000.[29] The United States as a whole experienced a net immigration of at least 6.2 million residents during the 1980s.

Figure 4

Residential Movers by Age: United States and Selected Countries Around 1980



Source: Larry Long, *Population Studies*, Vol.46 (forthcoming article, 1992).

In the developing world, where internal migration is dominated by moves from the countryside to the cities, rural areas often experience net out-migration while urban areas have high rates of net in-migration.

Types of moves

The U.S. population is extremely mobile by world standards. In recent years, for example, about four times as many Americans changed residence as residents of Ireland. The residential mobility rate is the proportion of a population that moved during the past year. In the United States, the rate has varied between 16 percent and 21 percent since 1960. Almost two-thirds of this movement involved moves within the same county. Intra-county movers generally are making housing adjustments or responding to life cycle changes such as leaving the parental home, marriage, or divorce. Longer distance moves are primarily for economic reasons such as seeking a new job or accepting a corporate transfer. Others move long distances to attend school, to change climate or lifestyle, or for family reasons. Residential mobility can foment social problems when there is too much of it, or when it adversely affects the places of origin or destination.[30]

Who migrates?

Age

In most countries, residential mobility is relatively high for children under age 5; relatively low during the mid-teens; and extraordinarily high for persons in their early 20s. Thereafter mobility rates decline, rapidly at first, and then more gradually with age (see Figure 4). Young adults, especially those of college age are the prime movers (if not yet shakers) in most societies.

UNHCR

The similarity of the curves for the countries in Figure 4 reveals the link between life cycle events and residential mobility. Mobility is high between the late teens and the early 30s as individuals leave their parent's homes to attend college, find jobs, get married, and build families. Naturally, the young children of these people also have high rates of mobility. As older parents buy homes and settle into neighborhoods and careers, their mobility and that of their children (who by this time are in their teens) declines. The elderly tend to stay put, although a sizable minority become transplanted retirees while others move out of their family homes into smaller residences or life-care facilities.

Sex

In the United States, women are about as likely as men to migrate, but the rapid increase in mobility in the late teens starts earlier for women than for men, owing to the fact that women tend to marry at a younger age than men.

In many Latin American countries, the important stream of rural-to-urban migrants is dominated by young women because they are more likely to find a job in urban areas, often as domestic workers. In African countries, however, the men are much more likely to move to the city to find work.

Race and Ethnicity

In the United States, members of minority groups move more often than whites, but they tend to move shorter distances. In 1986, for instance, the proportion of whites who moved was 18 percent compared to 20 percent for blacks and 23 percent for Hispanics.[31] Residential moves among blacks are less concentrated in the young adult ages. These racial differences are attributable to the fact that blacks are more likely to be poor and less likely to own their residence.

Socioeconomic Status

There is no simple link between residential mobility and occupation or income. Doctors, lawyers, and others who rely on local bases of operation have low rates of mobility, for example, while business executives often are highly mobile.

Box 3

How Often Do People Move?

Most national data on residential mobility come from questions asked by the U.S. Census ("Where did you live on this date five years ago?") or by the Census Bureau's Current Population Survey ("Where did you live on this date one year ago"?). These data were used to calculate the age-specific rates for the United States in Figure 4. But how can we answer such questions as: how many times does the average person move?; or how often does the average person move?

As with fertility and mortality, it is not possible to answer these questions for real people. But it is possible to answer them for imaginary people using the life table approach. This is done by estimating the number of moves a hypothetical cohort will make in its lifetime if it is subject to the age-specific mobility rates (and mortality rates) of a given year. When demographer Larry Long used this life table approach on 1982 data for the United States, he found that a hypothetical cohort of 100,000 individuals would move to a new residence 10.5 times over their lifetimes.[1] This is the source of the oft-quoted statement that the average American moves about 11 times over a lifetime.

The other oft-quoted statistic, the average number of years between moves, can be calculated by dividing life expectancy (which was 74 years in 1982) by the number of lifetime moves (10.5). The answer, 7.0, suggests that the average American moves once every seven years. But there are enormous individual differences in the propensity to move. Some individuals move nearly every year, thereby inflating the mean; others hardly ever move.

Reference

1. Larry Long, *Migration and Residential Mobility in the U.S.* (New York: Russell Sage Foundation, 1988).

Only educational attainment is clearly related to mobility, and that relationship is U-shaped. The most frequent movers are individuals at the educational extremes, the high school dropouts and the college educated. Those in the middle, who complete high school but do not go on to college, have the lowest mobility rate.

The distance of moves does differ by education. The best-educated make relatively more long distance moves; the least-educated make relatively more local moves.

International Migration

International migration is a worldwide phenomenon. At the beginning of the 1990s, international migration streams of one sort or another were making headlines around the world—the dramatic stampede of East Germans into West Germany; white South Africans "taking the chicken run," as South Africans derisively call it, out of that nation; Turks leaving Bulgaria to avoid forced assimilation; the influx of Asians into Australia; and the emigration of Soviet Jews to Israel.[32]

These migrations occurred for the traditional reasons—the migrants either wanted to upgrade their lot in life or escape from difficult, often intolerable, circumstances. In short, migrants are "pushed" from their homeland by difficult conditions and/or "pulled" to a new country where conditions appear better.

The United States is traditionally a country of immigrants, and presently receives twice as many immigrants as all other countries combined. Many experts estimate that nearly 1 million newcomers have immigrated to the United States annually over the past few years—the highest level since the mass immigration of Europeans in the decades before and after 1900.

During the 1980s legal immigration averaged about 700,000 persons a year. Illegal immigration probably averaged between 200,000 and 400,000 persons per year although some estimates run even higher.[33] The numbers seeking to enter the United States are not likely to abate in the near future because of continuing population and economic pressures in the Third World, particularly in Mexico and the Caribbean basin.

Around 150,000 U.S. residents emigrate each year. Most are older immigrants who are returning to their country of origin to spend their last years; others are simply looking for a country with a lower cost of living. Indeed, Mexico now has more U.S. Social Security beneficiaries than any other foreign country.[34]

International Migration Differentials

Age

Young adults and their children are more likely than older individuals to immigrate to a new country. The immigrant flows to the United States traditionally have been dominated by young adults. Although U.S. immigration policy with its guiding principle of family reunification (giving preference to relatives of previous immigrants) has diminished the proportion of young adults among recent immigrants, young adults are still the predominate legal, and particularly illegal, immigrants to the United States.

Sex

Males have traditionally outnumbered females among immigrants. An extreme example of this phenomenon was the 27-to-1 male-to-female ratio among Chinese immigrants to the United States in the early 1900s. Today the ratio is nearly one-to-one (1.02 males for every female), at least for legal immigrants. The male-to-female ratio is substantially higher, however, for refugees, asylum-seekers, and illegal aliens.[35]

Race and Ethnicity

The vast majority of immigrants to the United States between the early 1800s and the mid-1960s were Europeans. But for most of the 1980s, Europeans accounted for only about 10 percent of immigrants. About 43 percent of legal immigrants came from Asia and another 43 percent from Latin America. Africa contributed only 3 percent. The vast majority (80 percent) of all illegal immigrants come to the United States from Latin America.[36]

Socioeconomic Status

Often the more ambitious and adventuresome people in a poor society are the ones who migrate. Migrants tend to be more educated than others in their home community, but less educated than the residents of the country to which they are moving. However, immigration laws can alter the type of person allowed in, for example, by restricting unskilled workers and encouraging highly educated professionals.

Often the more ambitious and adventuresome people in a poor society are the ones who migrate.

Legal immigrants as a whole have higher socioeconomic status than natives in their country of origin, but somewhat lower status than U.S. residents. But the differences vary greatly among individuals and immigrant groups. With respect to education, for example, 1980 Census data show that 67 percent of the total U.S. population aged 25 and over had at least completed high school compared to only 52 percent of immigrants. But the proportion completing high school was much greater for immigrants from Africa (82 percent) and from Asia (73 percent), especially from India (89 percent); and lower for immigrants from Latin America (41 percent), particularly those from Mexico (21 percent).[37]

Statistics on occupation and income tell a similar story. Among the largest immigrant groups, Asians have a relatively high socioeconomic status and Hispanics a relatively low one. However, during the 1980s, a heavy influx of less-educated Southeast Asians has brought more economic diversity to the Asian immigrant population. While the incomes of Asians remain higher than for other groups, there is also growing poverty among those Asians at the bottom of the socioeconomic ladder.[38]

The "Brain Drain"

When educated and highly skilled people emigrate to a new country, their home country loses. Not only does the home country lose its investment in raising and educating those ex-patriots, it also loses their potential social and economic contributions. This "brain drain" is not just a problem for developing countries such as India. Many top scientists, engineers, and college professors from Great Britain and other developed countries now work in the United States.

Migration is a social process involving social networks that connect the place of origin to the place of destination .

Migration and Social Networks

Individuals usually do not choose to uproot themselves and their families at random to move to another area; nor do they choose their place of destination by flipping a coin. Migration is a social process involving social networks that connect the place of origin to the place of destination. The movement of individuals takes place through chain migration, defined as movement in which prospective migrants learn about job opportunities, transportation, and housing in the place they want to move to from relatives or friends from their home area who have migrated ahead of them.[39]

Chain migration operates in both international and internal migration. In the former, a few bold immigrants blaze a trail to a new country, establish a foothold, and then send for friends and family to join them. These individuals form small ethnic communities, such as the Chinatowns in cities throughout the world, which act as magnets (or "pull" factors) to others in the place of origin. Most immigration to the United States has followed this pattern. It is still operating today. Hispanic and Asian immigrants often join established colonies of their compatriots such as Little Saigon in Orange County, California. Moreover, U.S. immigration policy encourages chain migration by granting entrance visas to selected foreign relatives of current U.S. residents.

Chain migration also played an important historical role in rural to urban migration. The presence of a network of relatives and friends in a particular city attracts rural outmigrants to that city and helps ease the problems associated with relocation. While chain migration is not as important in the United States today as it was in the past, moving "to be closer to families and friends" is still one of the main reasons given by individuals for internal migration.[40]

But when it comes to social networks, migration is a two-edged sword. While it may bring new opportunities, migration often tears individuals loose from existing social networks with deleterious effects. Migrants must give up their familiar home and a network of relatives and lifelong friends who often provided valuable financial, health care, and other support.[41] It is no wonder that much migration is movement back to the embrace of such social networks.

Population Size and Growth

Whether a population grows or wanes, the changes can be traced to the net effects of the three demographic processes discussed above: fertility, mortality, and migration.

Fertility adds members to the population and mortality removes them. Thus, the annual number of deaths in a population can be subtracted from the annual number of births to find the net number of persons added through **natural increase.** In 1990, there were 2 million more births than deaths in the United States. Worldwide, there were 93 million more births than deaths.

The death rate can be subtracted from the birth rate to find the **rate of natural increase.** The crude death rate for the United States in 1990 was

Box 4

The Demographic Balancing Equation for the World and the United States (numbers in thousands)

	Starting Population, 1990	+	(Births	-	Deaths)	+	(Immigrants	-	Emigrants)	=	Ending Population, 1991
			Natural Increase				*Net Migration*				
World	5,245,071	+	(142,959	-	50,418)	+	(NA	-	NA)	=	5,337,612
			92,541								
United States	248,168	+	(4,179	-	2,162)	+	(853	-	160)	=	250,878
			2,017				*693*				

NA: Not applicable

Source: Based on data from the Population Reference Bureau, the U.S. Bureau of the Census, and the National Center for Health Statistics.

9 deaths per 1,000. Subtracting this from the U.S. birth rate of 17 yields a rate of natural increase of 8 per 1,000 or as it is more commonly expressed, 0.8 percent. The world death rate was also 9 in 1990; however the world birth rate, at 27, was much higher than the U.S. rate. Thus, the world's rate of natural increase was 1.8 percent, twice the U.S. rate.

The rate of natural increase is added to the rate of net migration to yield the overall population growth rate, as summarized by the population balancing equation (see Box 4).

Population growth can be positive, as it is in most national populations; negative, as it was for the city of Detroit in the 1980s; or zero, as it currently is in Denmark.

The rate of growth can be used to estimate a population's **doubling time,** the number of years until the population will double assuming a constant rate of growth. Doubling time can be estimated by dividing the number 70 by the growth rate expressed as a percent. For example, a population growing at 2 percent annually would double in 35 years, one growing at 1 percent would double in 70 years.

World and National Populations

World population in 1990 was 5.2 billion and was growing at a rate of about 1.8 percent annually. World population is growing today because births exceed deaths by a wide margin, as shown in Box 4. Net migration, of course, is not a factor in world population growth, and it never will be unless space colonization becomes a reality. Nearly 1 billion more inhabitants will be added to the Earth before the end of the 20th century, and another 4 billion by the middle of the 21st century.

The actual size of the Earth's population in 2000, 2050, or thereafter is unknown. But demographers can make projections, which are really educated guesses about future population size. Population projections are based on assumptions about the future number of births and deaths (and immigrants and emigrants for country populations) for each future year. The projected population size for any future year can be determined by summing the estimated population growth for each year in the interval and adding that sum to the current population.

Using these basic principles, the United Nations recently projected that world population in the year 2025 will reach 8.5 billion, using what they deemed the most likely fertility and mortality trends. The U.N. also published upper and lower limits for the population in 2025, ranging from 7.6 billion to 9.4 billion.[42]

China is the world's most populous nation with a 1991 population of 1.2 billion. Its population is increasing by 1.4 percent each year. India, with fewer inhabitants (860 million) but a higher growth rate (2.0), is catching up. If these rates continue, there will be as many Indians as Chinese by the end of the 21st century.

In the 1990s, most of the world's fastest growing countries are in Africa. Kenya's 1991 population of 25 million is increasing at 3.8 percent annually, meaning that it could double in only 18 years if there is no significant decline in birth rates. The population of the entire region is growing at nearly 3 percent, yielding a doubling time of only 23 years.

In contrast, many countries are experiencing extremely slow growth or even natural decline. In both Hungary and Germany, deaths exceeded births in the late 1980s.

The Population of the United States

The United States is the fourth most populous nation in the world, trailing only China, India, and the Soviet Union (as of fall 1991). The U.S. population increased by an estimated 2.7 million people during 1990 because the number of births and immigrants exceeded the number of deaths and emigrants. Note the relative contribution made to growth by natural increase and net migration

Households and families are the primary units through which individuals relate to society.

Box 5

Households and Families

Households and families are the primary units through which individuals relate to society. When the characteristics of these units change (in terms of their numbers, the age or the marital status of their members, for example) there can be profound social and economic consequences. Household characteristics, in turn, while highly sensitive to the age structure of the population, also reflect social and economic changes. An economic squeeze may prolong the time adult children live at home; a rise in the divorce rate may increase the number of single-person households; and relaxed social rules about marriage may boost the number of unmarried couples setting up house.

A household is composed of the person or persons who occupy a housing unit. Households may be one of two types: family or non-family. Family households include two or more individuals who are related by birth, marriage, or adoption; although they also may include other unrelated persons. Non-family households consist of people who live alone or who share their residence with unrelated individuals.

In the United States, the mix of household types has changed enormously over the last two decades. One of the most notable changes is the drop in the proportion of family households. In 1970, 81 percent of all households were family households, but by 1990, this had dropped to 71 percent. This decline occurred primarily because so many more people are living alone. Americans are waiting longer to get married, if they choose to marry at all. Married couples are more likely to get divorced than they were in the past. More of America's elderly are living alone after the death of a spouse. All these social trends produced increasing numbers of single-person households. In 1990, 25 percent of all U.S. households consisted of just one person, compared with 17 percent in 1970. Many European countries have seen a similar rise in single-person households for pretty much the same reasons.

The profile of the shrinking pool of family households is changing as well. Married-couple families accounted for 79 percent of all U.S. families in 1990, down from 87 percent in 1970. Married-couple families with dependent children also constitute a shrinking proportion of all U.S. families. Their share dropped dramatically between 1970 and 1990, from 87 percent to 72 percent. At the same time, the percentage of such families headed by a single woman doubled, from 12 to 24 percent.

in Box 4. The latter, which includes both legal and illegal immigration, contributed just over one-fourth of the population growth in 1990 and about one-third of the growth during much of the 1980s. Because fertility and mortality are expected to remain at relatively low levels in the United States, the most volatile demographic variable driving future growth is immigration.

According to Census Bureau projections, the U. S. population could reach a peak of 309 million around 2040, and then start to decline, falling back to 292 million by 2080.[43] But we should remember that these projections are based on speculation about future trends in fertility, mortality and migration.

Population Composition

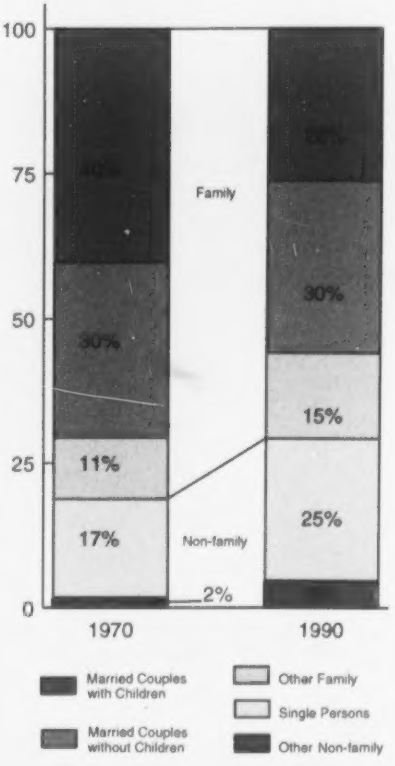
People have many characteristics that have demographic dimensions including their sex, age, race, ethnicity, occupation, education, religion, and marital status, and living arrangements (see Box 5). A population has corresponding characteristics constructed from personal traits of individual members. The age compo-

The coming of age of the U.S. baby-boom generation hastened many of the changes in the makeup of U.S. households. When the baby boomers reached adulthood, they moved out of their parent's homes and set up their own households, often alone or with housemates. They married later than the previous generation. They were subject to higher divorce rates. And, there were so many of them. The number of Americans in the 30 to 34-year age group grew by 89 percent between 1970 and 1990 as the baby boomers entered these age groups. But the number of households headed by a person in this age group grew more—98 percent—primarily because of the changes in marriage, divorce, and living arrangements. Americans born after the baby boom are delaying marriage even longer. Thirty-one percent of women who were 25 to 29 in 1990 had never been married, compared with only 21 percent of women in this age group in 1980 and 11 percent in 1970. The choices these women make about marriage and childbearing will help determine the future makeup of U.S. families and households.

References:

1. U.S. Bureau of the Census, *Current Population Reports* P-20, No. 447 (Washington, DC: GPO, 1990); *Current Population Reports* P-20, No. 450 (Washington, DC: GPO, 1991); *Statistical Abstract of the United States 1990* (Washington, DC: GPO, 1990).

U.S. Households



sition of a population, for example, is determined from the collective ages of all its members. This *Bulletin* focuses on age, sex, race, and ethnicity because these characteristics are fashioned solely by the prime demographic forces of fertility, mortality, and migration.

Age and Shape of Societies

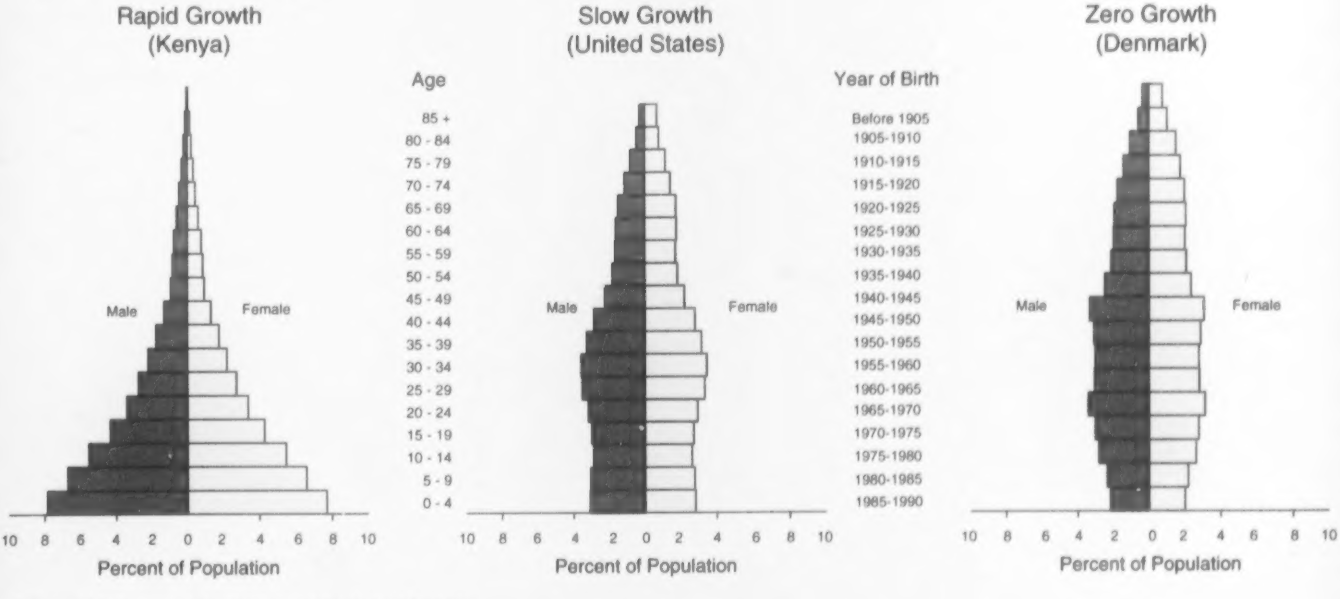
The age composition of a society can be depicted by a population pyramid, a figure that shows the proportion of the population in each age group. Notice in Figure 5, for instance, that about 18 percent of the population of Kenya is under age 5, while only about 4 percent is over age 65. The sum of the proportions in all age groups equals 100 percent of the population.

There are three general types of population pyramids: rapid growth, slow growth, and near zero growth. A rapid-growth population is the only one that really looks like a pyramid because each age cohort is larger than the one born before it. This pyramidal shape results primarily because of high fertility. If couples in one generation average eight children, for example, their children's generation will be about four times larger than their own generation. Thus, the pyramid would be about four times as wide at the base as in the middle. These pyramids also get their distinctive shape because of high mortality in the past. The older age groups have relatively few surviving members and occupy a relatively small section of the pyramid. The base is broadened by the fact that mortality, particularly infant mortality, is declining. This results in a larger proportion of the younger birth cohort surviving to the next age group.

Because the vast majority of people in rapid-growth societies are young, there is tremendous momentum for future growth because this large pool of young people are the parents of the future. Even if they only have four children apiece (the average for less developed countries), their children's generation would be twice the size of their own. Kenya's population age structure is typical of a young, rapid-growth society.

Nearly stationary populations such as that of Denmark look more like rectangles than pyramids. Each cohort is about the same size as every other

Figure 5
Age Patterns of Population



Source: U.S. Bureau of the Census and the United Nations.

one because the birth rate and the death rate have been low and relatively constant for a long time. This means that each age group is about the same size at birth and, since relatively few people die before old age, the cohorts remain close in size until late in life when mortality rates must rise and eat away at the top of the rectangle. Because a relatively high proportion of people in near-stationary populations are old, these populations are called "old" societies. They are at or near zero population growth.

A slow-growth population is generally in the process of changing from a rapid-growth to a near-stationary shape in response to changes in fertility and mortality. The United States is typical of these "middle age," slow-growth societies.

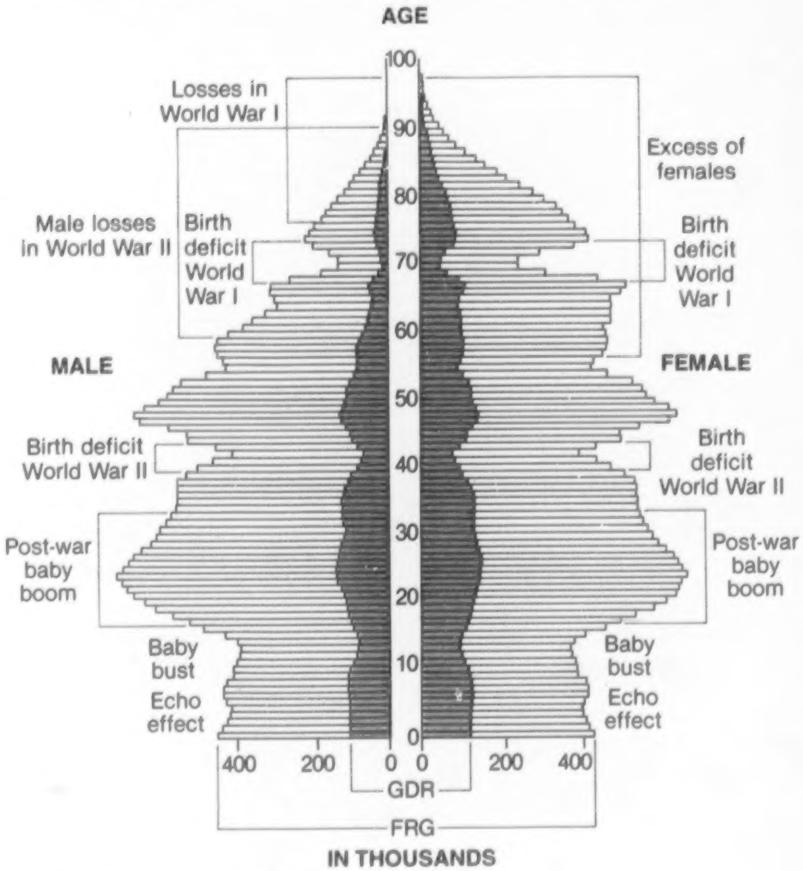
Population pyramids also can be shaped by migration. Since migration is age-selective, it alters the shape of both the place-of-origin and place-of-destination pyramids. In general, since migrants tend to be disproportionately young, the place-of-origin pyramid grows older, and the place-of-destination pyramid grows younger. But there are plenty of exceptions to this rule. The pyramid of the state of Florida, for example, has grown older because of the influx of retirees.

Migration can also be sex-selective, as it is for labor migrants in the Middle East. Oil-producing United Arab Emirates, for example, brings in thousands of men to work in its oil industry.

Pyramids also reflect historical events—wars, famines, baby booms or busts, or changes in immigration policies—that have affected one of the three demographic variables. Consider the tumultuous events portrayed in the pyramid for Germany in Figure 6.

Figure 6

Germany's Population by Age and Sex, 1989



NOTE: FRG = West Germany, GDR = East Germany
Source: Population Reference Bureau.

Median Age

Population pyramids depict the general shape of a population's age structure, but do not provide rates or measures that can be compared over time or with other populations. One such summary measure of age composition is the median age—the age at which exactly half the population is younger and half is older. In general, developing societies have rapidly growing populations with low median ages, while advanced societies have slow-growing or near-stationary populations with high median ages. For example, in 1990, Jordan had a median age of 16 compared to 37 for Denmark.[11]

Because more than three-quarters of the world's population lives in developing societies, the Earth's overall age structure is young. Thus, the Earth is primed for rapid population growth over the next century even if world fertility declines to a two-child family average.

The United States

The age structure of the United States looks more like a bowling pin than a pyramid (see Figure 5). This shape resulted from drastic swings in the number of births, from the historic low of the 1930s, to the baby-boom peak of 1957, down to the baby-bust low of the mid-1970s, and back to the baby boomlet of the 1980s and early 1990s. The pyramid's middle-age bulge is composed of the baby-boom cohorts which are making their way up the structure as time passes. The baby-boom bulge has been likened to a swallowed pig moving through a python.[45] The narrower base is made up of the baby-bust cohorts born since the late 1960s. Each year the U.S. population gets older, primarily because of the aging of the baby boomers and continued low fertility. Continued increases in average life expectancy also has contributed to the aging of the population. The U.S. median age was 32.3 in 1988, up from 27.9 in 1970. The median age could rise as high as 46 in the 21st century.[46]

CLEO PHOTOS

Effects of Age Composition

The age structure of a society has a profound impact on its demographic and social character. Some of these impacts have been noted already–for example, the effect of age structure on population growth and on the average age of a society. But the effects of age structure are so pervasive it is almost impossible to summarize them.[47] Perhaps a few additional examples will suffice.

In 1985, the Soviet Union amended its military draft law to include women aged 19 to 40 because the pool of eligible young men was declining as a result of continued low fertility.[48] Similarly, the aging of U.S. society will have wide-ranging effects on everything from education to health care, the job market, and even funeral industry stocks. Since baby boomers are now moving into middle age and their parents into old age, it is inevitable that "elder care" issues will gain momentum. The elderly may compete with children for the private and public resources required to provide comprehensive care. Indeed, the aging of America may be the most significant challenge this country faces in the next half century.

Age composition is relevant to many seemingly unrelated social problems. As the U.S. baby-boom generation has passed through its life cycle, it has faced shortages in schools, housing, and employment. Excess supply often has been left in its wake, because by the time the economy had geared up to meet the needs of the baby boomers, they had passed on to another phase in their life cycle.

Similarly, the magnitude of a social problem may increase or decrease simply because of changes in the age composition of a society. As the proportion of elderly people increases, so does the proportion who are chronically ill, all other things being equal. Theoretically, rates of violent crime should decline as the percentage of the population ages 18 to 24 (the age group most often involved in crime) edges downward between 1990 and 2000. Changes in age composition can alter the severity of a social problem even if there is no change in the underlying causes.

Sex Composition

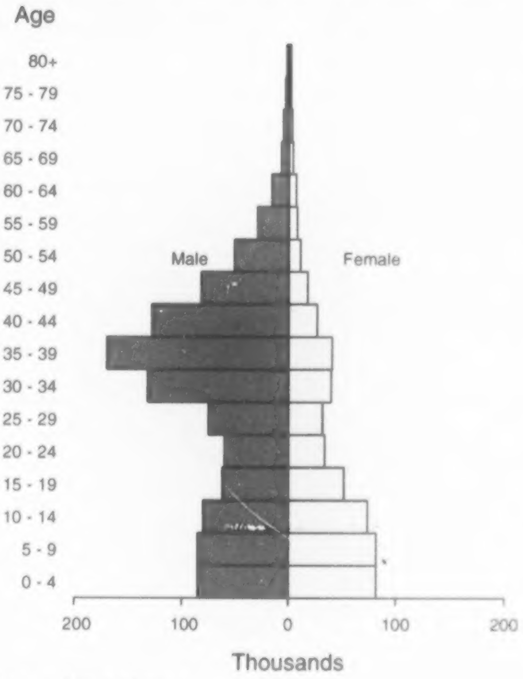
Population pyramids also show the relative proportion of men and women in each age group. Small differences are difficult to discern, but some are obvious. Consider the bite out of the male side of Germany's pyramid for those aged 60 to 90. This reflects the military casualties of World War II, as well as longer female life expectancy.

But the sex composition of a population can be summarized best by the sex ratio: the ratio of males to females. This ratio is usually expressed as the number of males for every 100 females. The world's sex ratio in the late 1980s was 101, or 101 males for every 100 females. The ratio for advanced societies was 94; for developing nations, 104. A few countries have extremely high sex ratios. The United Arab Emirates, for example, had a sex ratio of 218 in the late 1980s—more than two men for every woman.

Sex ratios are determined by the now familiar forces–fertility, mortality, and migration. The influence of migration on the sex ratio is easiest to assess. The unbalanced sex ratio of the United Arab Emirates (UAE) came about because the UAE had brought in thousands of foreigners from Asia and other parts of the Middle East to work in its oil fields. Nearly all these labor migrants were men unaccompanied by their families. The effects of this selected immigration pattern is evident in the population pyramid for the UAE shown in Figure 7.

Figure 7

Unbalanced Sex Ratio: United Arab Emirates, 1985



Source: United Nations.

Mortality influences the sex ratio because of the sex differences in death rates at nearly every age. The sex ratio at conception may be as high as 150, but a male fetus is more likely than a female to be miscarried or stillborn. The sex ratio at birth ranges between 103 and 106 in most regions of the world. It then begins an inexorable descent in most societies because more males than females die at every age. In the United States, the ratio of men to women is about equal (the sex ratio is 100) between ages 25 to 29. By ages 50 to 54 it has dropped just below 95, and for the 85 and over group, the sex ratio is only 39. This preponderance of females at the older ages can be seen in the top bars of the U.S. pyramid.

Fertility affects the sex ratio by controlling the proportion of young people in a population. Any force that increases the relative proportion of young people in a society—as does a high fertility rate—raises the overall sex ratio of the society because the sex ratio is higher in the younger ages. A rapid drop in infant and child mortality, for example in response to large scale inoculation campaigns or the importation of modern medical technology, also contributes to the "younging" of a population. Conversely, any force that decreases the relative proportion of young people—such as high mortality or low fertility—lowers the overall sex ratio.

In some nations, however, cultural factors override the biological advantage that women usually have. In Indian society, for example, women are accorded a low status. Girls receive less food, medical care, and familial attention than boys, and they die at higher rates.[49] This discrimination is reflected in the sex ratio of India—estimated at 107 in the late 1980s. Sons are highly valued in many other Asian countries as well, often to the detriment of daughters. The sex ratio for all of South Asia is 107, compared with 100 in Latin America, also a developing region.

An unbalanced sex ratio in the young adult years–due to migration, fertility swings, or war casualties, for example–means that there may not be enough men or women for everyone to get married.

Effects of Sex Composition

Why does the sex ratio matter? One reason is its affect on the availability of marriage partners. An unbalanced sex ratio in the young adult years—due to migration, fertility swings, or war casualties, for example—means that there may not be enough men or women for everyone to get married. But a scarcity of potential marriage partners is not merely a personal disappointment for individuals who really want to get married, it affects the social, psychological, and economic structure of society.[50] Marriage rates, childbearing practices, family stability, and even the comparative status and power of women and men can be influenced by the sex ratio.

In the United States, for example, the annual increases in the number of births during the baby boom created a "marriage squeeze" in the 1970s and 1980s by producing more women than men in the prime marrying ages. This phenomenon, along with the continued mortality gap between the sexes, has been linked to many of the changes in the American family since the 1960s: increasing numbers of single women, rising age at marriage, falling fertility, increasing rates of divorce, growing rates of out-of-wedlock childbearing, rising female employment, and increasing female earnings.[51]

Sociologist William Julius Wilson has argued that a shortage of marriageable black males in poor ghetto areas is partially responsible for the dramatic increase in out-of-wedlock births and female-headed families among African Americans.[52] In these areas, the pool of black men who could support a family has been depleted by high rates of unemployment and incarceration, and the high mortality rates for young black men.

Similarly, the sex composition of immigrant groups has a bearing on the speed and ease with which they adjust to their new society. An immigrant group containing more men than women, for instance, may compete with native men for marriage partners. This possibility, even if it never happens, invites resentment and even social disorganization.[53]

Racial and Ethnic Composition

Many population characteristics are fluid. A person's age increases constantly, and educational attainment and marital status can change over time. Other characteristics are fixed at birth, like gender. Race and ethnicity fall into the second category. But although an individual's ancestors cannot change, the way societies evaluate and classify them is highly variable. Societies differ in their definitions of race and ethnicity, as well as in the political and social significance of these variables.

What are race and ethnicity? The two terms are often used interchangeably, but there are technical differences between them. Race is often defined in terms of a person's physical characteristics, such as skin color, hair or facial features. Ethnicity, on the other hand, emanates from cultural characteristics,

Box 6

Where Do Demographic Data Come From?

Demographers use a variety of rates, ratios, and other measures to study population. But these measures are only as accurate as the data from which they are calculated. Where do these demographic data come from? How accurate are they?

Most demographic measures are based on **counts** of people or demographic events (for example, births) in a specific area during a specific time period. There were 248,709,873 residents in the United States during 1990, for example, and 1,730,000 births in Iran. Counts come from population censuses, vital registration systems, national registers, and surveys. Their accuracy varies greatly by country and even by region within countries.

The **population census** forms the cornerstone of demographic analysis. In many countries the census—an enumeration of all households —is the main source of national population data. During the 1980s, about 94 percent of the world's population was covered in a national census. But censuses usually miss a small percentage of the population, especially in hard-to-enumerate areas such as the mountains of Turkey or poor ghettos within some U.S. cities.

The population characteristics censuses record also are subject to error. Residents may lie about their income or forget the exact ages of some household members.

Vital events—births, deaths, marriages, and divorces—are usually recorded in **national vital registration systems**. These are the source of the counts used to calculate fertility, mortality, marriage, and divorce rates. But in countries in which mothers give birth at home, or where many residents are illiterate, a large proportion of vital events are never recorded. Less than half of the world's population lives in countries that have "complete" vital registration systems. Even "complete" systems may miss up to 10 percent of a country's vital events.

A few countries have comprehensive registration systems, or **national population registers**, that track individuals from birth to death and record changes in their residence or marital status.

Surveys often provide estimates of demographic events where registration systems are inadequate and aid in developing estimates of population size during the long interval between censuses. Surveys usually collect data for a sample group within a specific geographic area. In the United States, a monthly national survey is used to track the unemployment rate as well as many demographic indicators. But surveys suffer from many of the same accuracy problems as censuses and registration systems, and their data are subject to varying degrees of error.

Demographers have developed statistical techniques to overcome some of the shortcomings of the basic data with which they work. They apply these techniques to the best data available to compute **estimates** of the actual population counts and measures. Although estimates based on good data can be quite accurate, users of these estimates should not forget that estimates are only approximations of the true number.

Likewise, users of demographic data always should question the source and quality of the data that underlie the rates, ratios, and proportions they cite. Judging the quality of data is one of the most important skills demographers must learn. Indeed, everyone would benefit from taking a hard look at the myriad of statistics we encounter daily. "In a world where people are very numerous and where many people use numbers to convince others to behave in certain ways, a responsible citizen has no choice but to become numerate as well as literate."[1]

Reference

1. Carl Jay Bajema, "Garrett James Hardin: Ecologist, Educator, Ethicist and Envrionmentalist," *Population and Environment* 12, no. 3 (Spring 1991), p. 196.

such as language, religion, country of origin, or even clothing, food, and family relationships. In popular usage, the terms are socially, not scientifically, defined.

The United Nations publishes data on ethnic composition reported by individual countries, but warns that they are "a series of categories which are not uniform in concept or terminology....By the nature of the subject, these groups vary from country to country—no internationally relevant criteria can be recommended."[54]

On U.S. census forms, residents are asked to identify themselves as belonging to 1 of 15 "race" groups: white; black; American Indian; Eskimo; Aleut; 9 Asian and Pacific Islander categories (including Japanese, Samoan, and Filipino); and Other.

Changes in racial and ethnic composition come about through differences in the fertility, mortality, and migration of individual groups.

Table 2

U.S. Total and Hispanic Populations by Race, 1990

Race	U.S. Population	U.S. Hispanics
Total Population (in millions)	248.7	22.4
Percent	100	100
White	80	52
Black	12	4
American Indian, Aleut, and Eskimo	1	1
Asian and Pacific Islander	3	1
Other	4	43

Source: 1990 U.S. Census.
NOTE: Percentages may not add to 100 because of rounding.

The second largest U.S. minority group, Hispanics, is missing from this list. Hispanics are considered an ethnic group, like Italians or Poles, not a race. Although the majority report themselves as white, Hispanics may be of any race. For example, many Filipinos identify themselves as Hispanic, and many Dominicans and Puerto Ricans in the United States are Hispanic, but also of African ancestry. A substantial number of Hispanics report their race as "Other."

Although exact definitions are elusive, race and ethnicity remain important variables in the demography of the United States and most other countries. The relative size of individual groups often helps determine their political power and social and economic status. Shifts in racial and ethnic composition can alter the prevailing social structure and foment prejudice and social unrest. Lying behind such problems is the basic concern that some other group will grow faster than one's own and, consequently, increase its share of the population and its importance within the society.

Changes in racial and ethnic composition come about through differences in the fertility, mortality, and migration of individual groups. Major shifts in racial and ethnic composition are occurring in countries throughout the world. In South Africa, whites are becoming an ever-smaller minority owing to a lower birth rate and a higher emigration rate than blacks. In northern Ireland, Protestants are losing their majority status because Catholics are having more children. In Israel, the Arab population is growing much faster than the Jewish majority. If this continues, the Arabs will become the majority in Israel early in the 21st century.[55] And in many European countries, immigrant groups from third world countries are growing faster than their hosts, leading to anti-immigrant backlashes.[56]

The United States

Racial and ethnic diversity has been a hallmark of the United States since colonial times. Waves of immigrants from different parts of the globe, and differential fertility and mortality between those groups and native-born Americans has kept the racial and ethnic composition in flux. This uneven growth continues, driven by the current differences in fertility, mortality, and migration discussed in earlier sections. If present trends continue, white non-Hispanics eventually will become a minority group in the United States, perhaps by the second half of the 21st century. While most U.S. residents now trace their ancestry to Europe, by 2050 the majority may trace it to Latin America, Asia, Africa, the Middle East, or the Pacific Islands.

African Americans are still the most numerous U.S. minority group, but they now account for less than one-half of the total minority population. Because of greater immigration and higher fertility, Hispanics will outnumber blacks early in the 21st century, becoming the nation's largest minority group. Asians will move from a trace element to a sizable minority. It is unlikely that any single racial or ethnic group will outnumber white non-Hispanics in the near future, but white non-Hispanics may fall from being the majority group to being the largest of several large racial/ethnic minority groups.

The evolving ethnic composition is already having a profound impact on almost every aspect of American society, from social values and culture to education, politics, and industry. More public schools must teach non-English speaking students, and in most big city school districts, white non-Hispanics are already a minority. Some universities have been charged with having covert racial quota systems for admissions, a phenomenon that serves as a reminder that building and sustaining a multiracial society is difficult and fraught with social problems.

Population Distribution

Where do the earth's 5 billion inhabitants live? Demographer's answer this question by keeping tabs on the distribution of population by world region, by country, by province or state within countries, by urban and rural area, and by neighborhood within cities. The geographic distribution of population is, once again, determined by fertility, mortality, and migration.

World Population

Population is unevenly distributed among the world's regions, and because of the disparate growth rates discussed in the population growth section above, distribution is becoming more unbalanced. The developing regions encompassed two-thirds of the world population in 1950 and just over three-quarters in 1990. And, according to World Bank projections, these regions will contain 85 percent of world population by 2025, and nearly 90 percent by 2100.[57]

Although fertility is the primary cause of the uneven population growth rates among world regions, migration does play a role. Indeed, international migration is at an all time high in the 1990s. Movement occurs from the less affluent developed nations to the more affluent ones, for example from Portugal to France, and from the poorer developing nations to relatively prosperous ones (from Colombia to Venezuela). But the most significant movement is from third world nations to developed countries.

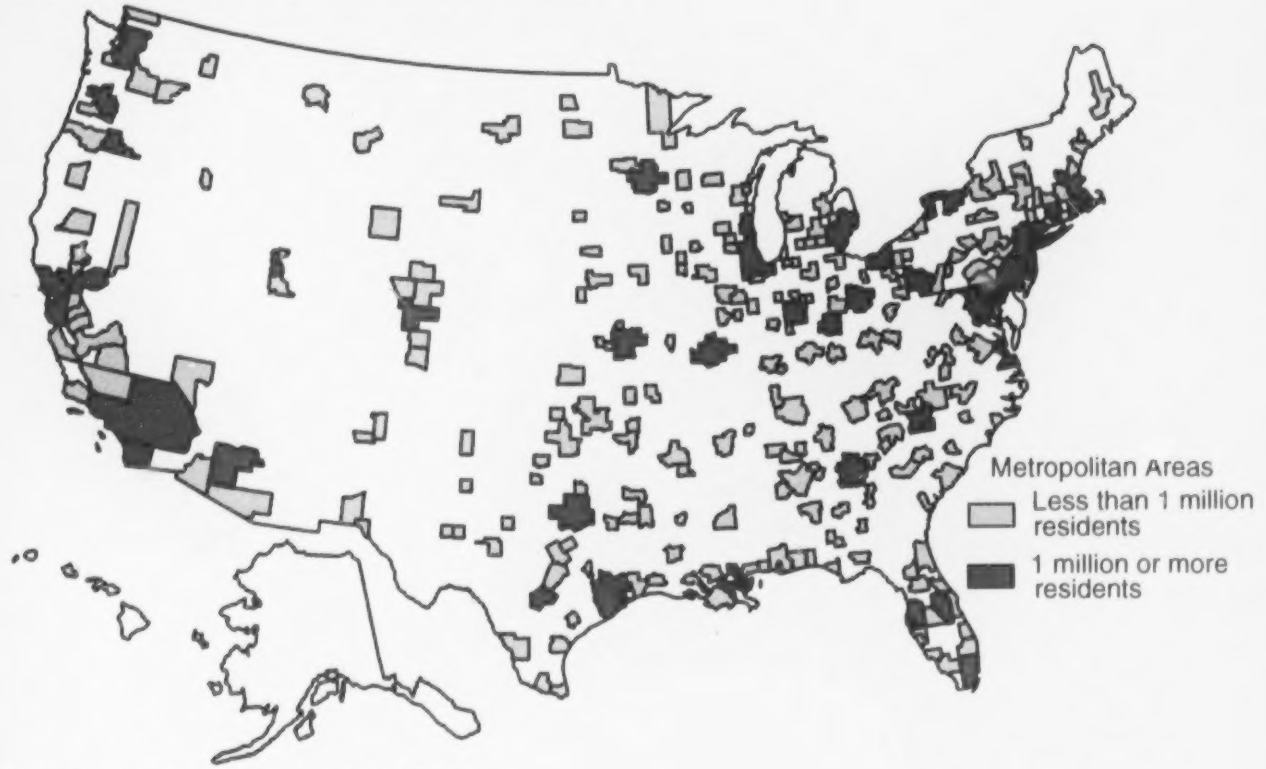
Nevertheless, although migration is at an all-time high, only about 1 percent of the Third World's population growth—just the growth, not the population itself—is absorbed by the developed nations through this process.[58]

A major feature of population redistribution in the Third World is urban growth. The urban population of these nations rose from 286 million to 1.5 billion between 1950 and 1990. About 60 percent of this urban growth was caused by natural increase, the difference between the number of births and deaths of current city dwellers (both those born in the city and those who migrated there). The rest of the urban growth occurs because of rural to urban migration.[59]

One conspicuous consequence of this growth is the proliferation of jumbo-sized cities in the Third World. In 1950, Shanghai was the only third world city with a population of more than 5 million. But the U.N. predicts that by the year 2000, there will be

Population is unevenly distributed among the world's regions, and because of the disparate growth rates . . . distribution is becoming more unbalanced.

Figure 8
Metropolitan Areas in the United States, 1990



Source: Population Studies Center, University of Michigan.

over 40 such cities including 19 with more than 10 million inhabitants.

Rapid population growth quickly overwhelms the public services and housing supply in these cities, not to mention the supply of jobs. Millions of residents cope by building makeshift shelters on open land and trying to make a living on the streets, often creating their own informal economic and social systems. Gigantic shantytowns have sprung up around major cities throughout the Third World, a testament to the explosive growth in these cities.

The U.S. Population

Like world population, the U.S. population is unevenly distributed. More than half the U.S. population lives within 50 miles of a coastal shoreline.[60] Mountains, deserts, and long distances, in conjunction with unrelated economic factors, have limited population growth in many parts of America's middle section.

Population density, the number of inhabitants per square mile, ranges from 1,035 in highly urban New Jersey to one in Alaska, the loneliest place in America. Many sections of America's heartland are sparsely populated. Wyoming has only 454,000 people, fewer than Austin, Texas, and 26 other U.S. cities.[61] Parts of Minnesota are so eager to populate that they offer free parcels of 40 acres to individuals willing to settle there.[62] Yet the midwestern states of Illinois, Ohio, and Michigan rank sixth, seventh, and eighth in population size, compared with the other 50 states.

The most populous region of the country is the South, with 34 percent of the population, followed by the Midwest (24 percent), the West (21 percent), and the Northeast (20 percent).

The distribution of the U.S. population is always changing because of geographic differences in natural increase and net migration.

International and internal migration have always been the main determinants of redistribution, but natural increase also plays a role. Utah, which has among the highest fertility and longest life expectancy of any state, experienced an 18 percent population growth during the 1980s solely because of natural increase. Net migration was negative during the decade–more people moved out of Utah than moved in.

International migrants settle disproportionately in certain states and communities, often close to their port of entry into the United States. Indeed, the U.S. Immigration and Naturalization Service reports that about 70 percent of all newly-arrived immigrants live in just six states: California, Texas, New York, New Jersey, Florida, and Illinois.

Within the United States, migrants tend to follow several long-established migration streams. The first stream flows from the eastern seaboard states westward, a demographic process that has occurred since colonial times and that ultimately pushed the American frontier out to the Pacific Ocean. This process continues today. The second stream runs from rural to urban areas. In 1910, 35 percent of the U.S. population lived in metropolitan areas. By 1990, about 78 percent of the U.S. population lived in metropolitan areas, 50 percent in areas with 1 million or more inhabitants (Figure 8). A third major migration stream surfaced during the depression years, and led from economically depressed areas in the South to the cities of the Northeast and North Central states. This southern exodus included millions of African Americans during the middle decades of the 20th century. Beginning in the 1970s, however, there has been return migration to the South with net in-migration of blacks and an even greater influx of other Americans. This phenomenon is part of the fourth and now major stream, the movement from the Snowbelt states to the Sunbelt states.[63]

More dramatic and more rapid than regional shifts in population is the redistribution of population within and around metropolitan areas. City neighborhoods can change fundamentally within a decade, from middle-class family homes to densely populated ghettos of non-English-speaking immigrants. Rolling farmland 30 miles from downtown can sprout dense townhouse developments. Because these changes affect a community's tax base, public school enrollment and student-body composition, traffic congestion, and public services, they often spark contentious political battles.

The Census Bureau has detailed definitions for metropolitan areas and their constituent parts—central city and suburb, for example, and combinations of these parts (such as Consolidated Metropolitan Statistical Area or CMSA). As growth patterns, as well as the socioeconomic relationships among the components of metropolitan areas change, definitions change. After each decennial census, metropolitan areas in the United States are redefined, usually by expanding them to include adjacent counties. In 1990, there were 284 metropolitan areas defined by the U.S. Census Bureau, ranging in population size from 57,000 (Enid, Oklahoma) to 18 million (New York City and environs).

After each decennial census, metropolitan areas in the United States are redefined, usually by expanding them to include adjacent counties.

The major facts regarding the population growth and change within metropolitan areas can be summarized as follows:

- metropolitan areas have grown faster than nonmetropolitan areas for all of this country's history except for the 1970s;
- within metropolitan areas suburban areas have grown more rapidly than central cities (indeed, many central cities such as Philadelphia have been losing population for several decades); and
- metropolitan areas continually expand outward from original central cities, gobbling up additional cities and counties in their path. (Los Angeles, for instance, has more incorporated cities within its sprawl than do some states.)[64]

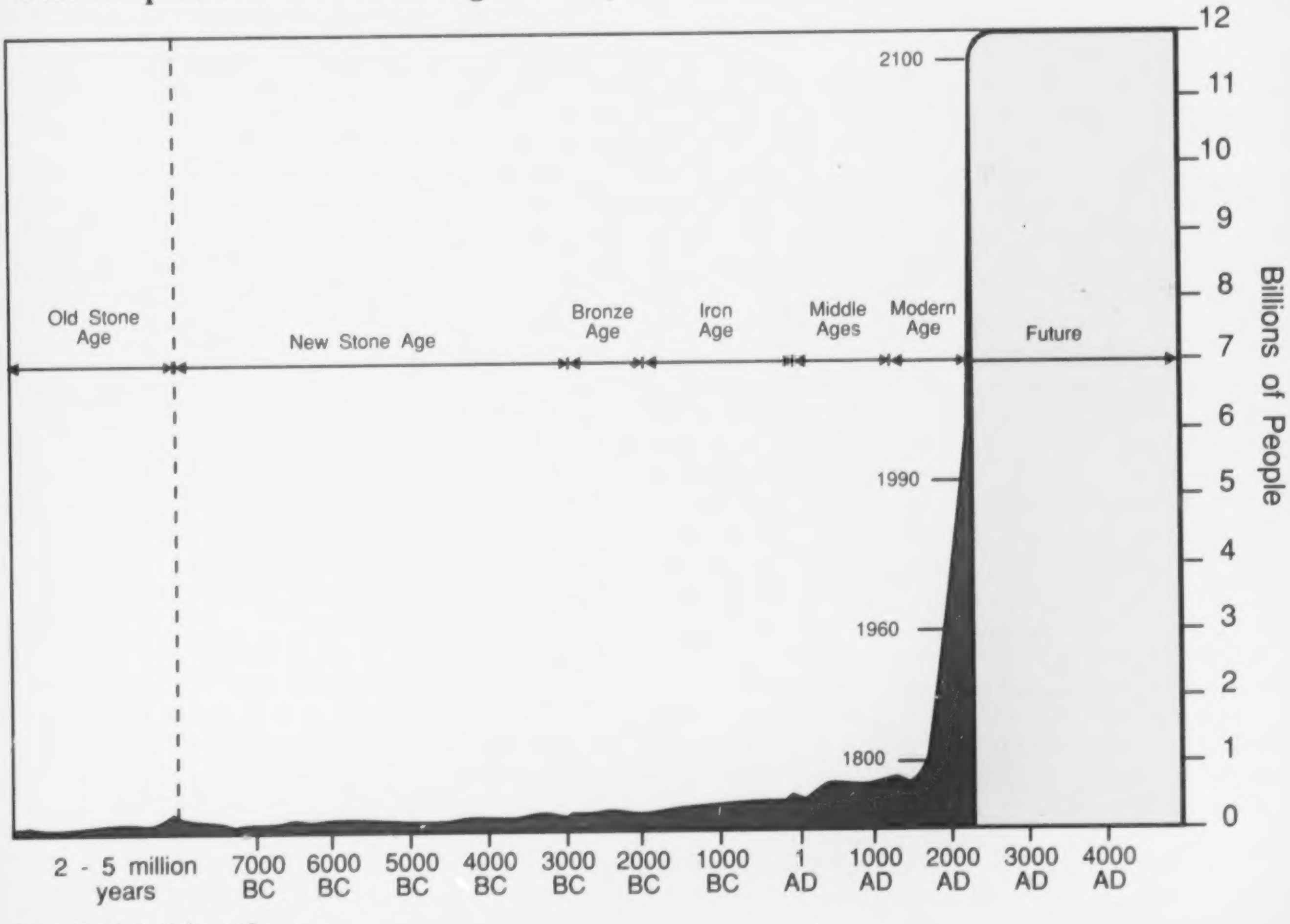
Population distribution and redistribution affect the demographic composition of the areas involved, with many social consequences. For example, the high rate of migration into Florida of both immigrants and internal migrants in the 1980s has not only moved that state from seventh to fourth place in population rank, but has fundamentally altered the state's age, racial, and ethnic composition. Similarly, the flight from central cities to the suburbs is predominantly a movement of the middle- and upper-classes, thus leaving behind groups that are disproportionately poor. With respect to blacks, William J. Wilson argues that the urban poor lost an important source of social and economic support when middle- and upper-class blacks moved out of central cities.[65]

Population Growth Issues

The Population Explosion

During the first 2 to 5 million years of human history, world population never exceeded 10 million people. Because the death rate was about as high as the birth rate, the rate of population growth was scarcely above zero. Significant population growth began about 8000 B.C., when humans began to farm and raise animals (see Figure 9). Because of improved nutrition and a more settled lifestyle, death rates began to fall. By 1650 world population had expanded about 50 times—from 10 million to 500 million. Then world population

Figure 9
World Population Growth through History



Source: Population Reference Bureau.

shot up another 500 million people in just 150 years, reaching its first billion around 1800. It added a second billion by 1930, after only 130 years; a third billion by 1960, only 30 years later; a fourth billion by 1975, just 15 years later. The fifth billion, reached in 1987, took only 12 years. World population will exceed 6 billion by 2000, and another billion persons will be added every 11 to 13 years until about the middle of the 21st century. It took all of human history for the world's population to reach the first billion, now each new billion is added in just over a decade.

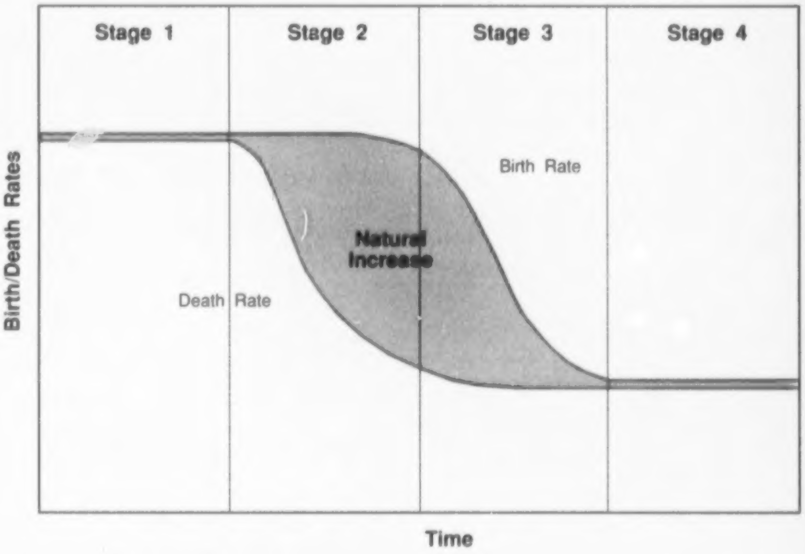
But the population explosion, as it is often termed, is not just an awe-inspiring accumulation of people. It has a myriad of other demographic and societal consequences such as massive international migration and the proliferation of gigantic cities with mammoth shantytowns. Indeed, while a few population scholars downplay the negative impact of population growth,[66] most believe that population growth multiplies the damage created by other world problems.[67] For example, population growth exacerbates environmental degradation and resource depletion, and puts unmanageable pressures on government institutions, national economies, and virtually all other resources.

Population growth is not solely responsible for these social problems. Environmental degradation, for example, is brought about not only by the number of people, but by how much they consume and the degree to which their consumption damages the environment. Poverty often is produced by an uneven distribution of income within a country, not just large numbers of people. Solving these social and economic ills generally requires direct action by policymakers. Just slowing population growth will not solve such problems, but it contributes to their solution.

Demographic Transition

The unprecedented growth of world population in the modern era resulted from the change in the ratio of births to deaths. Prior to this, the birth rate and the death rate fluctuated around a relatively high level (Figure 10), essentially canceling each other out. This formed the first stage of a process called the demographic transition. The death rate was high in these societies because of poor health and harsh living conditions. Life expectancy at birth was less than 30 years. If birth rates had not also been high, societies would simply have died out–and many did!

Figure 10
The Stages of Demographic Transition



The cultures in these societies encouraged high birth rates through religious teachings and social pressure, essentially encouraging people to "be fruitful and multiply." Socially, a man's virility and a woman's status often were linked to the number of children they had. But large families also served a practical function in these societies—furnishing labor for family farms and providing support for parents during old age. Collectively, large families also increased the economic, political, and military power of the tribe or nation.

Stage two of the demographic transition began when the death rate began to drop in response to improved living conditions and health practices. But the birth rate continued at or near its stage one level, thus

The rapid decline in death rates without a coincident fall in birth rates ignited the unprecedented explosion in population growth in the developing world beginning in the 1950s and accelerating in the 1960s.

igniting the population explosion. Note that the population explosion came about as a result of lower mortality rather than higher fertility.

Why didn't the birth rate fall in tandem with the death rate? Most societies eagerly accept technological and medical innovation and other aspects of modernization because of their obvious utility against the universal enemy: death. However, the social value attached to high fertility is slower to change. Cultural lag also plays a role. It takes time for people to recognize that lower death rates create population pressures that can be eased by having fewer children. It can take generations to recognize, for instance, that it is no longer necessary to have eight children to ensure that four will survive to adulthood.

In the third stage of the demographic transition the birth rate moves downward, eventually catching up with the death rate. Population growth remains relatively high during the early part of the third stage, but falls to near zero in the latter part.

In the fourth and final stage of the demographic transition the birth rate and the death rate are close together again, but they fluctuate around a relatively low level as shown in Figure 10. Natural increase is close to zero.

The theory of the demographic transition evolved from the history of population growth in Europe and the United States. With their current low levels of population growth, nations such as the United States have largely completed the demographic transition. But most developing nations are still in stage two or the early part of stage three of the transition. Excluding China, the growth rate for developing societies in 1990 was 2.3 percent. If growth continues at that rate, the population of these countries will double in only 29 years.

Will developing countries eventually complete the demographic transition to low fertility and mortality? Most population experts assume they eventually will, although the process and even the end result may differ from the European experience.

The developing countries already have deviated from the path followed by Europe and the United States as they passed through the demographic transition. The importation of medical supplies and technology caused death rates to plummet in many parts of the Third World after World War II; in contrast, mortality declines in Europe occurred very slowly. The rapid decline in death rates without a coincident fall in birth rates ignited the unprecedented explosion in population growth in the developing world beginning in the 1950s and accelerating in the 1960s. Many developing countries, such as Mexico, Brazil, and Thailand, experienced dramatic declines in birth rates in the 1980s, aided by the availability of modern contraceptives. Yet fertility has remained stubbornly high in most of Africa and in many Asian and Latin American countries, prompting many demographers to question whether the demographic transition is an appropriate model for the contemporary Third World. Others debate just what actions or policies, such as improving the educational levels of women or making contraceptives easily available, will initiate or accelerate declines in the birth rate. Even if all countries eventually undergo the transition to low fertility and mortality, it is clear that individual countries are following very different timetables. The timetable for completing the demographic transition has enormous long-term consequences: This will determine the ultimate size of the world's population.

Future Prospects

If the present rate of population growth were to continue, world population would rocket to 10 billion by 2030, 20 billion by 2070, 40 billion by 2110, 80 billion by 2150, and so on. Indeed, humanity would outweigh the earth and then the solar system in a remarkably short period of time if the present high rate of growth continued indefinitely. But no

UNHCR

rate of growth can be sustained indefinitely. A positive growth rate of +.00001 ultimately would yield a population whose mass would expand at the speed of light, while a negative rate of -.00001 ultimately would carry humanity back past Adam and Eve.[68] Zero population growth (ZPG), which characterized human population for more than 99 percent of its history, must be achieved once again, at least as a long-term average, if the human species is to survive.

In order for the world to reach ZPG (assuming that mortality remains low or sinks lower as most demographers expect), the global TFR would need to drop from its present 3.4-child average to a two-child per woman average—replacement level fertility.

This cannot be attained immediately for two reasons. First, it is not likely that fertility in all countries will fall to replacement levels immediately. Fundamental social changes in childbearing behavior require time. Second, the world's present age composition will generate massive growth even if a relatively small family size becomes the worldwide norm in the near future.

Over one-third of the developing world's inhabitants presently are below age 15, and they inevitably will parent the largest birth cohorts in history. But, like any explosion, the population explosion will eventually fizzle out, probably by the end of the 21st century. By then, the demographic transition will have run its course in most countries of the world. A world growth rate near zero probably will be attained at that time as well. Most recent estimates of how large the world population will be when it stops growing are in the 11 to 13 billion range.

Can the Earth support such huge populations? The Earth's ultimate carrying capacity is unknown. As new technologies are devised and as resource management techniques are improved, the carrying capacity of the Earth expands, making it impossible to predict the ultimate number of people the world can support. However, many experts think that a world population of 10 billion may be the maximum that could be supported comfortably.[69] Other scholars believe that the world's basic biological systems—its forests, grassland, croplands, and fisheries—and its oil resources are insufficient to maintain a population of 10 billion. They foresee major systems failures long before the 10 billion mark is attained and predict that societies will be forced to restrict individual childbearing to stabilize growth.[70]

Whatever the peak carrying capacity of the Earth, world population might stabilize and remain uncomfortably close to that maximum level once population growth has ceased. Or, more optimistically, world population might decline to a lower, more manageable level for both humans and environment.

Negative Population Growth

There is no homeostatic mechanism that maintains a society at ZPG once it is reached. Societies can easily pass through ZPG and slip into negative population growth (NPG). Indeed, some population experts and interest groups would welcome such a population implosion.

But zero growth or population decline bring their own set of problems. One is that the population ages markedly; that is, the proportion of the population made up of older people rises dramatically. Older people consume a disproportionate share of medical and other costly public services. Labor force shortages also may develop. Most population scholars agree that if population decline is gradual, the negative effects of such problems are manageable. But if the down-sizing is rapid, the social and economic problems can be severe.[71]

Natural decrease (fewer births than deaths) is already a reality in Hungary and Germany. Most other European countries are at or near ZPG. One Council of Europe demographic study projects that there will be only half as

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many Europeans in 100 years as there are today.[72] Many European leaders fear that their declining populations will threaten their economies, their defense systems, and even their national identities. Various economic incentives to raise birth rates have been tried. In some European countries, couples receive housing or other benefits if they have children, and women on maternity leave are paid a percentage of their salaries and guaranteed a job. But these incentives are expensive and they have not managed to boost fertility enough to ward off population decline. Massive immigration is not viewed as an acceptable solution to population decline in most countries. Indeed, virtually all European countries have imposed strict restrictions on immigration. Some countries have tried to stimulate the return migration of resident immigrants.

Stringent government regulation of the number and timing of childbearing is not acceptable in most contemporary societies. The pronatalist policies now in place are considered long shots, and long-term population decline–or what has been termed "the second demographic transition"–appears inevitable for most of Europe.[73] Were it not for high immigration levels, the United States also would face negative population growth in the 21st century.

Concern about Population

The reader no doubt has noticed that many social problems emanate from the population processes of fertility, mortality, and migration. These include the scarcity and waste of social resources caused by baby booms and busts; premature death, especially in certain demographic subgroups; the heavy concentration of population in some urban areas and depopulation in rural areas; social disturbances caused by changes in a population's racial and ethnic composition; and the threat of declining quality of life for present and future generations because of continued world growth. The damage such problems produce is indisputable.

Americans are moderately interested in population problems. They have very general opinions on such issues as the desirability of population growth, the appropriate amount of immigration, and the "ideal" racial and ethnic composition of the population. But public concern about such issues does flare up occasionally. For example, during the 1980s concern rose sharply over the flow of legal and illegal immigrants into the United States. Polls indicated that Americans strongly favored imposing limitations on immigration and completely terminating illegal movements into the country.[74] This heightened concern was caused in part by the weak economy in the early 1980s, which raised fears of increased job competition, and to the media attention focused on immigration issues.

During the 1980s concern rose sharply over the flow of legal and illegal immigrants into the United States.

Nevertheless, most Americans do not view population problems as among our most serious social problems. Population problems typically lack the dramatic event—the startling calamity or outrageous incident—that galvanizes attention and action. Rather, they develop slowly and inconspicuously through the processes of birth, death, and migration.

Experts themselves often have disagreed on the severity of population problems. Debate about overpopulation has been going on at least since Aristotle, who cautioned that populations could outstrip their subsistence base, leading to poverty and social discord.[75] Thomas Malthus reached a similar conclusion in the late 18th century. He argued that the natural consequences of population growth are poverty and misery because the food supply cannot grow as fast as the population. On the other hand, Karl Marx and Friedrich Engels rejected this Malthusian view in the 19th century. They blamed poverty not on the poor or overpopulation but on the evils of social organization in capitalist societies. Overpopulation in their view was a natural feature of capitalism, and would not exist in socialist societies because socialism would provide enough resources for each person or motivate couples to reduce family size when resources were scarce.[76]

Today, the debate over overpopulation continues. Media articles on world population growth vacillate from doomsday hysteria to complacent unconcern depending on which experts are used as the source.

The recent upswing in concern about environmental problems has brought more attention to the consequences of continued world population growth. Commitment to the environment is the most deeply and widely held value among Americans, according to Gallup research; and this commitment increasingly is being extended to population issues.[77]

Media articles on world population growth vacillate from doomsday hysteria to complacent unconcern.

Expectations also play a role in determining the level of public concern about population problems. For example, when concern about the population explosion or population decline flares up, people tend to believe that the rate of growth—whether positive or negative—will continue until people are standing on each other's shoulders or until no one is left.[78] Such expectations, however, underestimate a society's ability to solve problems through social change.

Conclusion

The study of population dynamics involves the interplay between the three sources of population change: fertility, mortality, and migration. These variables determine the most basic characteristics of a population, as well as its demographic future. The unprecedented population growth that has taken place within the 20th century may abate toward the end of the 21st century. For the foreseeable future, however, the world will continue to grow and people will move to new regions and countries looking for a better life, giving demographers ample subject matter for study.

MICHAEL SILUK

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Discussion Questions

1. How do the intermediate variables help us understand fertility? How do they relate to socioeconomic variables such as education?

2. Why is the crude birth rate more easily obtained than the total fertility rate (TFR)? For what purposes is the TFR a more useful measure?

3. What social trends since the 1950s may have pushed the age-specific fertility rate for women aged 25 to 29 above that for women aged 20 to 24?

4. How is the measure of life expectancy similar to the TFR?

5. What are some practical applications of a life table?

6. How does HIV (AIDS) affect differences in life expectancy between black and white Americans and between men and women? Which age groups are most affected? Answer the same questions for at least one other major cause of death in the United States.

7. Find out the number of in-migrants and out-migrants there were for your state during the 1980s. Discuss their impact on growth, the economy and society.

8. Make a chronology of the residential changes you have experienced in your lifetime. Compare reasons for moving, distances of the moves, and the people involved.

9. Examine some of the "push" and "pull" factors in a selected immigration stream.

10. Discuss other social and economic consequences of migration for both the sending and receiving locations. Consider both internal and international migration.

11. Give specific examples of how changes in the age structure affect public expenditures.

12. Give examples of current global conflicts that may be wholly or partially driven by the racial and/or ethnic composition of a society.

13. Will the present trends in fertility, mortality and migration lead white non-Hispanics to become a minority group in the United States? Explain how this could happen.

14. What social, economic, historical, and demographic factors have driven recent shifts in U.S. population distribution? Consider population shifts between metropolitan and nonmetropolitan, central city and suburban, and from region to region (for example, from the Northeast to the Sunbelt). Discuss the consequences of these changes.

15. Name some specific interventions in the Third World that led to the decline of the death rate in the second stage of the demographic transition.

Prepared by Kimberly A. Crews

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Errata

References 4 and 6, page 39, are incorrect. Please substitute the following:

4. John Bongaarts, "A Framework for Analyzing the Proximate Determinants of Fertility," *Population Development Review* 4 (March 1978): 105-32; and William Petersen, *Population* (New York: Macmillan Co., 1975).

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POPULATION BULLETIN

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The Baby Boom—Entering Midlife

by Leon F. Bouvier and Carol J. De Vita

Abstract—America's baby-boom generation, born between 1946 and 1964, is the largest generation in U.S. history. Numbering over 80 million people in 1990, this giant generation has indelibly changed U.S. society, requiring adjustments in our schools, labor markets, housing markets, and government programs. This *Bulletin* takes a fresh look at the baby-boom generation as it enters middle age and reports on how well the generation is faring.

The authors show that the baby boom is not a single, unified group, but a collection of individuals whose experiences and expectations vary widely. The leading-edge baby boomers, for example, delayed marriage and childbearing and precipitated the baby bust. The trailing-edge baby boomers are now reproducing themselves and creating a baby-boom echo. Leading-edge baby boomers fought hard for an ambitious agenda of social change; trailing-edge baby boomers have been criticized for their cynicism and apathy toward the political system. African-American baby boomers registered real gains in educational achievement, but continue to trail behind their white counterparts. Baby-boom women, despite successful inroads into the traditionally male-dominated job market, report lower incomes than baby-boom men.

For the next 20 years, the baby-boom generation will be in its prime productive work years and laying the foundation not only for its own retirement, but also the nation's future. This *Bulletin* looks at work and retirement patterns, the Social Security system, and health care issues.

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The Baby Boom—Entering Midlife

by Leon F. Bouvier and Carol J. De Vita

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The baby-boom generation, born between 1946 and 1964, has been called the most "over-defined group of our time."[1] It has been blamed for the nation's ills, credited with its successes, observed, studied, analyzed, and scrutinized by writers, academics, planners, policymakers, business marketers, and the popular press. While it sometimes seems as if the attitudes, lifestyles, and problems of this giant generation should be known to all, accurate generalizations about the baby boom are difficult to make. It is a diverse collection of individuals whose needs continue to shape American society.

As America's largest generation in history, the baby boom has reshaped U.S. society. Its size alone—over 80 million in number in 1990—has required adjustments in our schools, labor markets, housing markets, consumer markets, and government programs. Yet the baby boom is not a monolithic group. As with every generation, experiences and expectations vary widely among its members.

The leading edge of the baby boom (born between 1946 and 1954) was at the vanguard of change, while the more numerous trailing edge (born 1955 to 1964) were crowded behind. As they matured, the older baby boomers enjoyed the advantage of arriving first. Vying for the best jobs, these leading-edge boomers left little room for later job entrants. The generation's trailing edge—often younger brothers, sisters, and cousins—endured split school-day sessions and faced tougher competition for college admissions. More baby boomers finished college than any previous generation, but the payoff that they reaped initially was a disappointing reminder that being a baby boomer meant passing through life's successive stages as part of a crowd. Even after earning college degrees, many baby boomers entered the workplace in blue-collar or lower-status clerical jobs.

As young adults, some baby boomers fought hard for an ambitious agenda of social change or dropped out of mainstream America seeking alternative lifestyles. The baby-boom generation broadened the bounds of acceptable (or at least tolerable) behavior. Couples lived together without marrying. Men were expected to pitch-in with housework and childrearing. Young women eschewed homemaking for the paid labor force, gradually venturing into traditionally male-dominated jobs.

The leading-edge boomers, by delaying marriage and childbearing, precipitated the baby bust. Now, the trailing edge of the baby-boom generation is reproducing itself, and a new demographic wrinkle has emerged: the baby-boom echo. Both the number of births and the birth rate increased during the 1980s as baby boomers began forming their families. These children—the baby-boom-echo generation—have turned into a crowd of their own and may well face similiar problems, disappointments, and advantages as their parents' giant generation.

Nobody predicted that there would be a baby boom. Once it arrived, nobody knew whether or when it would end. Everyone, however, knew it was there—school administrators, business marketers, Social Security planners.

The baby-boom generation is now entering middle age. The leading-edge boomers are reaching their mid-40s and their most potentially productive work years. In only 20 years they will be at the doorstep of retirement. This *Bulletin* takes a fresh look at the baby-boom generation—why we accord it special attention, what it will bring to middle age (and vice versa), and how it will continue to shape U.S. society. When the history of our time is written a century hence, it may well be said that the baby boom was one of the most powerful and enduring demographic influences on this nation.

What Caused the Baby Boom?

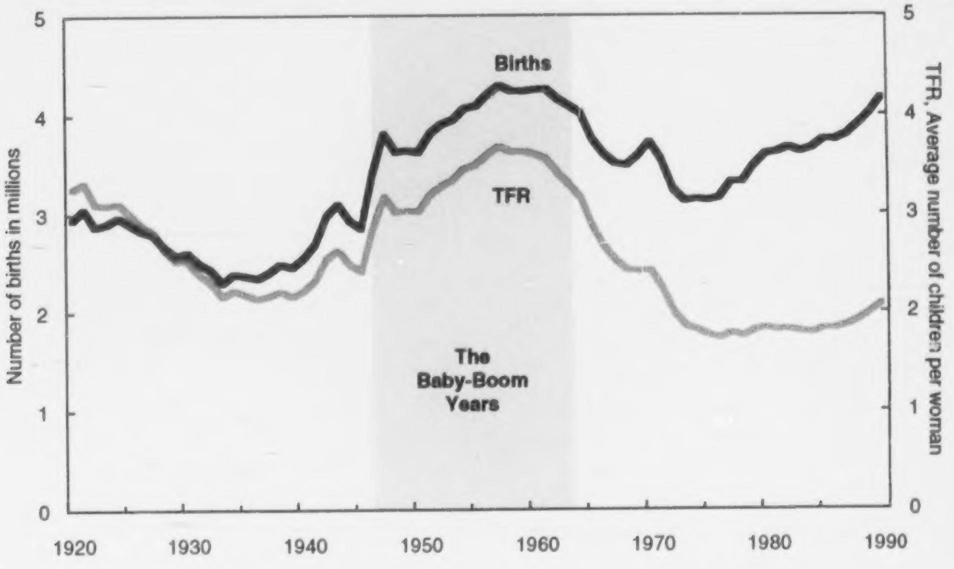
The baby boom resulted from an unprecedented decade-and-a-half long fertility splurge that materialized in the aftermath of World War II. Why American couples went on this fertility binge is still being debated, but the phenomenon upset what had been a century-long decline in the U.S. fertility rate. Most demographers were prepared for a brief postwar spurt in births, but the protracted surge that became the baby boom was beyond anything previously experienced or predicted. In the 1940s, most demographers were forecasting that the U.S. population would soon stop growing. In 1943, for example, demographers Warren Thompson and Pascal Whelpton projected that the nation's population

Mary Kent

During the 1950s, elementary school classrooms averaged more than 30 children per teacher.

Figure 1

Annual Births and Total Fertility Rate (TFR) in the United States, 1920-1990



Source: National Center for Health Statistics.

would peak at 161 million in 1985 and then begin to decline.[2] Instead, because of the baby boom and increased immigration to the United States, the U.S. population in 1985 was close to 240 million and growing by approximately 2 million people per year.

The mistaken forecasts of the early 1940s were based on more than mere extrapolation of past trends. They came from what was then (and still is) accepted sociological theory. With increasing urbanization and "modernization" would come a shift from a traditional to a more rational way of life. And with the advent of this modern and rational life, individualism would flourish, women would no longer remain in the home as homemakers, family functions would be taken over by specialized institutions, contraception would become universal, and large families would be relegated to the past.

Demographic Factors

Though no one fully understands what caused the baby boom, there are popular misconceptions about its origins. First, to label the phenomenon the "post-World War II baby boom," implies (erroneously) that its prime cause was the end of hostilities. When U.S. troops returned home, marriage rates skyrocketed (as did divorce rates) and family formation accelerated to compensate for years of separation. But this explains only the first short period of high fertility. After the initial spurt of births in 1946-1947, both the rate and number of births fell for the next three years (see figure 1). In 1951, these rates began to rise again and remained high throughout the decade and into the early 1960s.

Second, the baby boom did *not* represent a return to the large family of the 19th century. What happened was "a movement away from spinsterhood, childless marriage and the one-child family, and a bunching together of births at early ages. Only a minor part of the baby boom can be attributed to increases in the proportion of women having three or more births."[3]

The share of women having at least two births rose from 55 percent in the 1930s to 85 percent in the 1950s.[4] However, the average number of children that women actually had (that is, their completed family size) rose from a low of 2.3 children each, for women born in 1908, to a peak of about 3.2, for women born in 1935.

Although the baby boom did not bring a dramatic rise in large families, the percentage of women having three or more children did go up. Close to 60 percent of women born during the Depression years of the 1930s, who were in their prime childbearing ages during the peak of the baby boom, had borne three or more children by the time they reached their late-30s. This proportion is about 80 percent greater than the share of women born 20 years earlier who had three or more children when they were ages 35 to 39 (see figure 2).

The primary demographic causes of the baby boom, therefore, were more people marrying and having at least two children at early ages, as well as what may have been some "makeup" births among older women who were previously childless. The timing of these births to both younger and older women clearly affected demographic measures of fertility. The total fertility rate (TFR), for example, an indicator of the average number of children that would be born to each woman during her lifetime if she passed through her childbearing years conforming to the age-specific fertility rates of a given year, was clearly inflated by this timing factor. Between 1956 and 1960, U.S. women registered a TFR of over 3.6 children per woman—an extraordinarily high rate for a developed nation after World War II and 60 percent higher than the TFR recorded in 1940. In fact, no group of U.S. women born in the 20th century has actually averaged more than 3.2 births per woman.

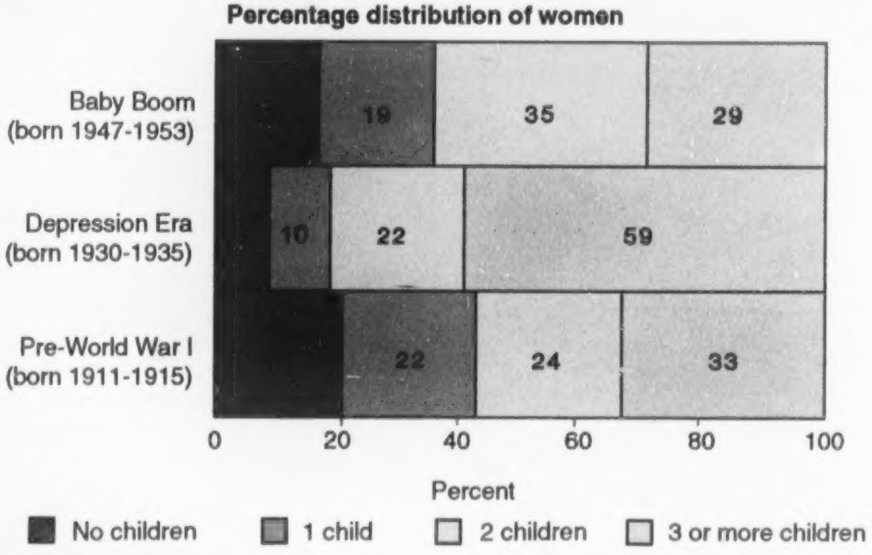
This timing peculiarity is especially noticeable in the total fertility rate of *first* births among white women during the baby-boom era. Between 1947 and 1957, the rate was almost always above 1, indicating more than one first birth per woman—clearly an impossibility for any real group of women. This statistical anomaly reflects the overlapping of two age patterns of childbearing. First-birth rates were very high for older women as well as for younger women during this period.[5] Older women who had delayed childbearing were rushing into motherhood, but it was the younger women who made the most difference.

For the young women of the 1950s, marriage came sooner than it had for their mothers or would for their daughters. In 1956, women's median age at first marriage stood at just over 20 years. Half of all women marrying for the first time in the early part of the baby-boom era were teenagers. By 1960,

Though no one fully understands what caused the baby boom, there are popular misconceptions about its origins.

Figure 2

Three Generations of Women at Ages 35-39 by Number of Children Born



Source: National Center for Health Statistics, *Vital Statistics of the United States, 1987: Volume 1, Natality* (Hyattsville, MD: Public Health Service, 1989), table 1-13.

near the height of the baby boom, 71 percent of women ages 20-24 were married, or had been married, compared with 54 percent in 1940 or 37 percent in 1990.[6]

Childbearing also began sooner. Among women who married between 1955 and 1964, half of the first births were in the first 15 months of marriage—an interval about half as long as that for women who married during the 1930s (26 months) or in the early 1970s (27 months).[7] During the 1950s, women had their second child by age 24.7 on average—down from age 27.1 in the 1930s.[8] Childlessness was rare. While about 20 percent of the women born in the early 1900s never had children, only about 9 percent of women who were in prime childbearing ages during the baby-boom era remained childless. In contrast, about 16 percent of women ages 40 to 44 in 1990 were still childless.

Roger Jones

Half of all first-time brides in the early 1950s were under age 20.

Economic Factors

What caused this headlong rush into marriage and parenting among young American women—behavior so different from that of their mothers a generation earlier and their daughters a generation later? For one thing, the U.S. economy expanded rapidly after World War II, first carried along by the stimulus of the war itself and later by the enormous expansion in transportation, housing, and government spending associated with the growth of metropolitan areas. Demand for labor was strong, and young people enjoyed an educational advantage over older workers because secondary schooling had expanded rapidly between 1920 and 1940. Encouraged by the availability of good jobs with relatively high wages and the prospects of rapid promotion, young people were quick to marry and start families.

The GI bill for education and Veterans Administration loans for housing also made it easy for veterans to get an early start at family-building. Young couples swarmed to the expanding suburbs with their three-bedroom homes and private yards. Raised in the relative deprivation of the Depression years, these young couples had not developed "tastes" for such luxury consumer items as a second car or a summer home. Extra income might well go into an extra child or two.

Social Factors

The baby boom was also characterized by a resurgence of traditional family values. The traditional family of American lore in which the husband was the sole breadwinner and the wife a homemaker resurfaced after World War II despite the fact that women had gone to work—and to college—in large numbers during the 1930s and 1940s. Betty Friedan called this image of women as passive helpmates the "feminine mystique" in her 1963 book that helped give rise to the rebirth of feminism in the United States.

Another reason for the baby boom was the ambivalence of couples toward preventing that "extra" third or fourth child and consequent carelessness or inefficiency in practicing contraception. National fertility surveys of 1965 and 1970 queried women about whether each of their pregnancies had been planned or wanted at the time of conception. "The answers reveal a great deal of unwanted fertility in the 1950s."[9]

According to demographer Norman Ryder, the two child family has been the "fixed" norm for American couples for most of the 20th century and "all people are expected to marry and have two children as soon as their economic circumstances permit." Economic conditions were unfavorable for fulfilling this norm in the 1930s and favorable in the 1950s. Having had two children early, young mothers of the 1950s faced many years of being exposed to the risk of an unwanted pregnancy. Because men's wages were rising during this period, women felt little economic pressure to enter a male-dominated work world and thus were likely to be ambivalent about the desirability of "yet another child" and apt to "relax contraceptive vigilance."

Just about every racial, economic, and religious segment of American society contributed to the baby boom. Birth rates among some groups, notably Catholics and blacks, increased even more than for other Americans.[10] But once the baby boom ended, the fertility rates of these groups fell in tandem with those of the general population.

Generational Size and Well-Being

Much of the interest in the baby-boom generation and its effects on society stems from the fact that it is a numerically large generation sandwiched between two substantially smaller generations. The relative size of the baby boom is perhaps its most unique and enduring characteristic. Whether the baby boom is an anomoly within contemporary population trends or part of a much larger historical cycle of fertility booms and busts is a subject of considerable debate.

Some analysts, most notably economist Richard Easterlin, theorize that the relative size of one's generation (or birth cohort) is an important factor in influencing the life chances and personal well-being of individual members of a cohort.[11] According to Easterlin's theory, the size of a generation shapes the social and economic climate of a society and hence the life choices that each individual must make. Small generations precipitate (and benefit from) labor shortages, which tend to increase wages and create more social and economic opportunity. Large generations, in contrast, create labor surpluses and hence command lower wages, encounter more congestion on the career ladder, and may even generate more unemployment. In short, small generations are likely to face a climate of promising economic circumstances, while large generations may struggle with greater economic uncertainty. Within this context, small generations, buoyed by optimism, are likely to marry early and produce large families. Large generations, tempered and cautious through experience, are likely to delay or forgo marriage and family commitments.

Easterlin's theory is based largely on the life experiences of the 1930s Depression cohort and the still unfolding experiences of the post-World War II baby-boom and baby-bust cohorts. For example, although the Depression hung over their early years, the 1930s cohort reaped the social and economic benefits of being smaller than the cohort that preceded it as well as the one that came after. They faced less competition in school, found jobs more readily, and advanced relatively quickly in their careers compared with the larger cohort that preceded them. Indeed, the 1930s cohort has been called the "good times" cohort because of the relative ease with which they established careers and prospered.[12]

On the other hand, because of its large size, the baby-boom cohort is thought to be less fortunate, even though the economic times have been much better. As economists John Katosh and Mathew Greenwald put it: "The baby boom's disproportionate size has distended every social institution it has dealt with—usually to the generation's detriment."[13]

While the actual life experiences of the baby-boom generation are still somewhat limited, some researchers are finding that the baby-boom generation appears to be doing less well economically than their parents' generation at similar stages of life.[14] This finding challenges the long-held assumption that each generation of Americans will enjoy greater material well-being and an improved standard of living than its predecessor. But other analysts argue that while the baby-boom cohort may have gotten off to a slow start in establishing careers or forming families, the effect is merely temporary. They have delayed, not abandoned, entering specific phases of the life-cycle process. In the long-run, it is argued, the baby boomers are likely to achieve as much success as previous generations.[15]

The real test of the cohort-size theory may well come with the maturing of the baby-bust generation.

The real test of the cohort-size theory may well come with the maturing of the baby-bust generation—the smaller cohort of individuals that follows behind the baby-boom generation (see box 1). According to Easterlin's theory, the small baby-bust generation (born primarily in the 1970s and roughly ages 11 to 20 in 1990) should find a more favorable social and economic environment than did the baby boomers. With fewer labor force entrants, employment opportunities for members of the baby-bust generation should flourish, wages should once again rise, and the material trappings of success may encourage the baby-bust generation to get married and start families at younger ages than their predecessors.

This is not to suggest any form of demographic determinism. Some individuals always seem able to beat the odds and succeed under adverse circumstances, while others may fail to seize even the most attractive and favorable opportunity. Yet, being born a member of a large or a small cohort does, in part, alters one's chances of succeeding. Demographic factors, however, do not operate in a vacuum. Rapid economic, technological, and political changes affect our daily lives and interact with demographic trends to create barriers and opportunities to social and individual well-being. While demography is not destiny, it is a

Alex de Sherbinin

The three-child family was commonplace during the baby-boom years.

Box 1

When Was the Baby Bust?

If the baby boom ended in 1964, when did the baby bust occur? There are two ways of looking at this question: by the number of births that occur each year or by the annual fertility rate. Each measure presents a somewhat different answer to the question of when the baby bust occurred—or indeed, if the bust has actually ended.

Focusing on the number of births, we see that throughout most of the baby-boom years there were more than 4 million births annually. In 1965, the number of births dipped below this threshold and remained below this mark until 1990. The nadir of the baby bust occurred during the 1970s with the lowest point occurring in 1973 when 3.1 million births were reported. By 1980, the number of births climbed back to 3.6 million annually—about the same number as in the early years of the baby boom. Considering numbers then, one could argue that the baby bust ended around 1980 when the annual number of births returned to the levels obtained at the start of the post-World War II baby boom. Alternatively, the end of the baby bust could be designated as 1990 when annual births rose above the 4 million mark.

Fertility rates, on the other hand, tell a different story. Until the baby-boom period, the total fertility rate (TFR)—or the average number of births per woman—had steadily declined. In the 1930s, it hit then-historic lows, hovering just above the replacement level of 2.1 children per woman. The baby boom, of course, changed this pattern. Between 1947 and 1964, TFRs ranged between 3.1 and 3.7. However in 1965, the TFR began to drop somewhat precipitously. In 1972, it dipped below replacement level for the first time ever in U.S. history and in 1976 hit an historic low of 1.7. The TFR remained fairly stable at approximately 1.8 until 1987 when it began to edge upwards. In 1990, the latest figure available, the TFR was estimated at 2.09—just barely below replacement level. If replacement level fertility is used as a criterion for determining what constitutes a baby bust, then the U.S. baby bust is not quite over, although it stands on the threshold of ending.

Although the number of births has increased in recent years, the average number of births per woman remains at or slightly below replacement level. This paradox—that a record number of women in the childbearing ages are still bearing record-small families—demonstrates the tremendous power that fertility changes have on the age structure of U.S. society. The large size of the baby-boom generation has provided a momentum for a series of population boomlets that will not subside for many decades. In contrast, the small size of the baby-bust generation will be reflected in successive small cohorts well into the future. Like a rock tossed into a quiet pond, each succeeding ripple grows smaller until a new stability is once again achieved.

powerful influence in shaping the life chances of individuals and societies.

Will We Have Another Baby Boom?

The recent upturn in the birth rate among U.S. women raises speculation that a new baby boom (or a baby boomlet) is underway. Easterlin, for example, has charted regular cycles of U.S. fertility levels which rise and fall about every 20 years. Small generations produce large ones, and vice versa. Why? Again, according to Easterlin, smaller cohorts have less competition for jobs as they enter working age, thereby encouraging early marriage and childbearing. Birth rates rise creating a baby boom. Large generations face the opposite situation when they reach adulthood. They delay marriage and bear fewer children, causing a baby bust.

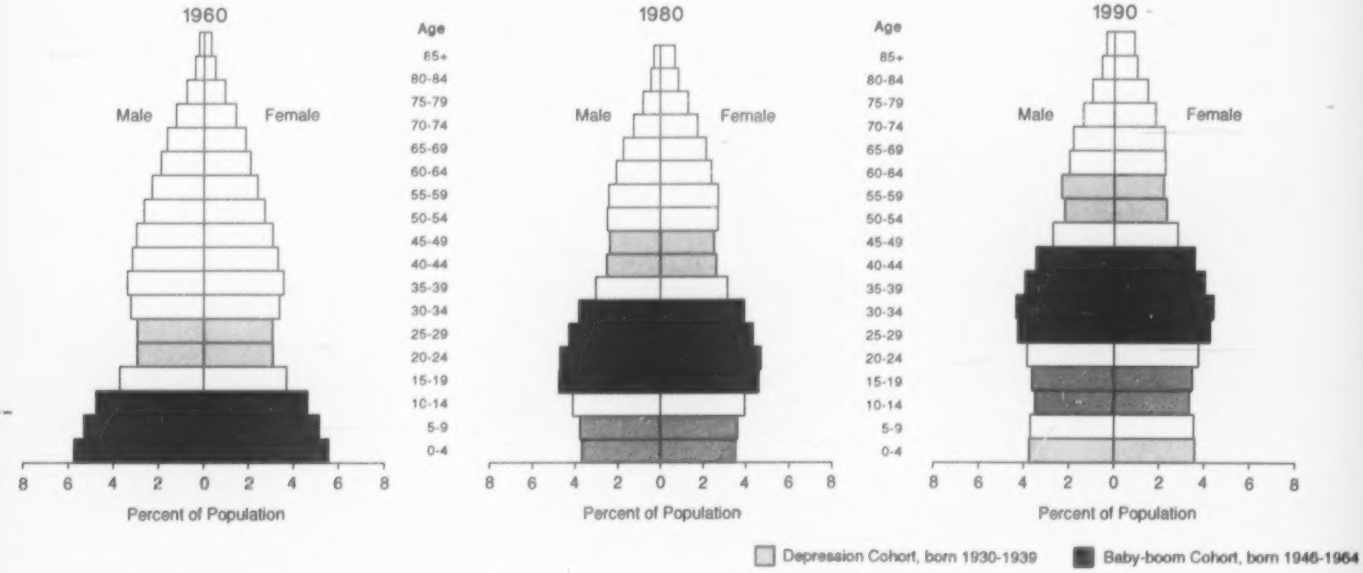
Following Easterlin's reasoning, the 1990s should usher in a new baby boom, or at least a boomlet. Structural changes in the economy and in social patterns, however, may dampen the size of this and subsequent swings in birth rates, Easterlin concedes. Continued high divorce rates, the greater share of women in the labor force, and later ages at marriage are not likely to reverse themselves in the near future, although some fluctuation in these measures may be evident. Traditionally, these factors all serve to keep fertility low.[16]

It is too early to know what the 1990s will bring. Although the birth rates and the number of births have edged upward, there are no other signs that significant fertility increase is imminent, according to Census Bureau demographer Martin O'Connell. Part of the explanation for the current increase is that baby-boom women who postponed childbearing are now having their children. But as the baby-boom women begin to leave the childbearing years (generally ages 15 to 49), the number of births may begin to drop once again. O'Connell points out that the average age at marriage has continued to increase, as has the percentage of women in college and in the labor force.

These factors may not inhibit childbearing as much as they did in the past, however. Women with preschool children are working in greater and greater numbers, despite the problems commonly associated with combining work and family life. More child-care options have become available, and more employers are beginning to institute benefits that allow working parents to juggle home and work responsibilities. While this does not necessarily foreshadow a return to large families, it may encourage more women to go ahead and have at least two children. The increasing fertility among younger women may also reflect the fear that infertility problems could develop by postponing childbearing too long.

The relationship between childbearing and marriage also has

Figure 3
U.S. Population Pyramids, 1960-2040



Source: U.S. Bureau of Census and PRB projections.

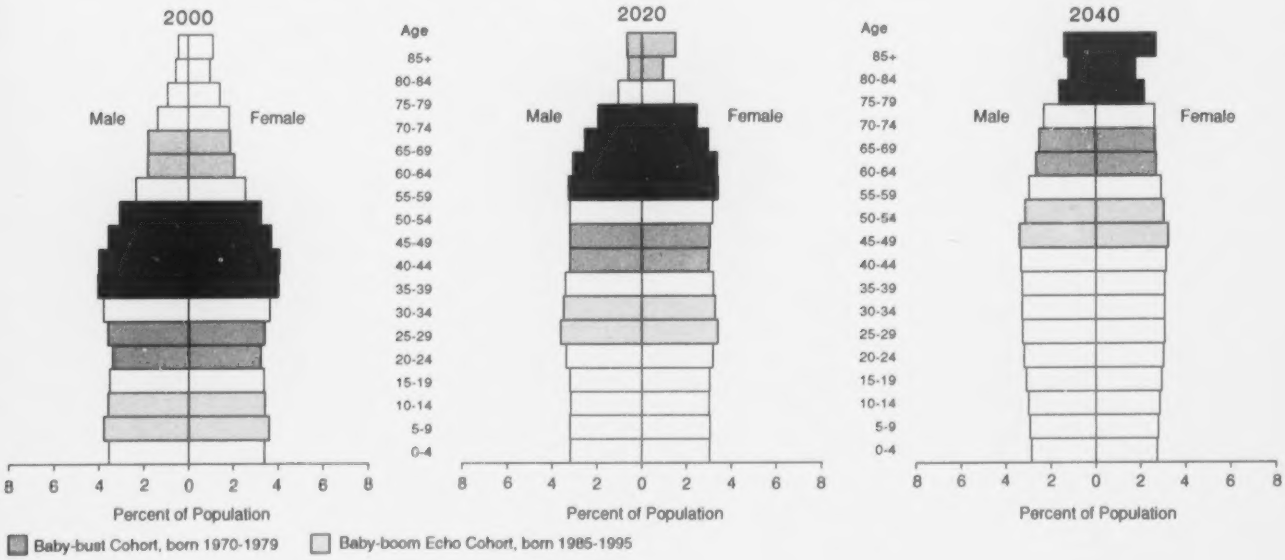
weakened. The number of babies born out-of-wedlock has skyrocketed in the past two decades. In 1985-1988, 31 percent of first births to women ages 20 to 24 were born outside of marriage, compared to 15 percent in the 1975-1979 period.[17] In 1960, only 6 percent of all births (including second and higher order births) occurred to unmarried women.[18] Also, there is some preliminary evidence that unwanted childbearing is on the rise for young black and white women, reversing a long-term downward trend.[19] One of the reasons for the end of the baby boom, as mentioned earlier, was the decline in unwanted fertility.

Finally, a phemomenon called "shifting shares" might be contributing to the rise in the fertility rate. Because the fertility of minority populations usually tends to be higher than that of the majority, increases in the proportion (or share) of minorities in the population result in an overall increase in fertility—even when the fertility of each group remains constant. In California, for example, the total fertility rate rose from 1.9 in 1982 to 2.5 in 1989. Almost 40 percent of that gain is attributable to the expanding proportion of minorities in that state's population.[20] To be sure, the "shifting shares" phenomenon is far less powerful for the nation than for a state like California that is growing rapidly and has many new immigrants. Nevertheless, it will undoubtedly play an increasingly important role in the nation's future.

In short, while the United States probably will not see a repeat of the 1950s' baby boom, one should not assume that it could not happen again. At the very least, some increases in fertility are already underway, although how long this upturn in births will last is not known.

Demographic Impact of the Baby Boom on America's Future

The demographic importance of the baby boom is best seen through a series of population pyramids. Figure 3 traces the changing shape of the age structure of the United States from 1960 to 2040 as the baby boom ages. While the size of



future generations cannot be predicted with complete accuracy because population projections necessarily stem from assumptions about future demographic behavior, particularly changes in fertility levels, the movement of existing generations through their life cycles can be clearly demonstrated.

> ***Fluctuating fertility is the major force that determines the age structure of the United States, but it is not the only one. Immigration also plays an important role.***

In 1960, members of the 1930s Depression cohort were 20 to 29 years old. Their fewer numbers cause a narrow spot in the pyramids even into the 21st century. By 2000, this cohort will be ages 60 to 69. At all ages, it is smaller than either its predecessor or its successor.

The baby-boom cohort (born 1946-1964) stands out in all the pyramids, even in old age! In 1960, it forms the base of the pyramid; by 1990, it extends across the broad middle section (ages 25 to 44); and by 2040, it represents the protruding bands of people age 75 and older. These pyramids vividly demonstrate the impact of this crowded generation as it passes through its life cycle.

In marked contrast is the baby-bust generation (born primarily in the 1970s). It is sharply defined by the pinched-in base of the 1980 pyramid. There were 7 million fewer births during the 1970s than during the 1950s. Throughout its life, this cohort will be overshadowed by its giant older relative—the baby-boom cohort—as well as the succeeding baby-boom echo.

The echo cohort—37 million in 1990—is considerably larger than its predecessor. However, it is only in 2020 that it catches up to the baby-boom cohort in size. By then, of course, mortality has begun to have an effect on the latter group.

Population momentum is aptly illustrated in these pyramids. Following the baby-boom echo is yet another interesting cohort, the baby-bust echo. It, in turn, is followed by yet another faint echo of the baby boom. By 2020, the population under age 10 is slightly larger than its predecessor, the baby-bust echo. Divergences in fertility, whether up or down, will have an impact on the size and age composition of the U.S. population for decades far into the future.

Fluctuating fertility is the major force that determines the age structure of the United States, but it is not the only one. Immigration also plays an important role in changing the size of America's age groups. Most immigrants who enter the United States are in the prime working ages (20-54). Therefore, not all people currently counted among America's baby-boom generation were actually born in the United States. Some are immigrants who came from other countries.

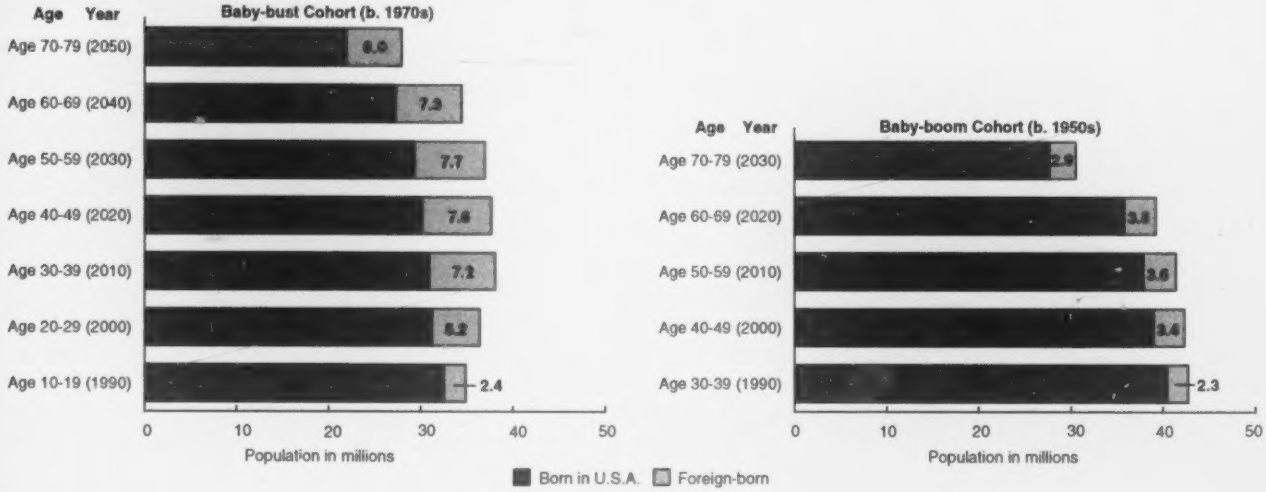
To illustrate how immigration has affected the size of the baby-boom cohort, we estimate that of the 42 million persons born in the United States during the 1950s decade, 40.4 million are now between the ages of 30 and 39 (see figure 4). However, according to the Census Bureau, the 1990 population for that age group totals 42.7 million. Thus about 5 percent of the age group are foreign-born, not U.S.-born "baby boomers." Although the size of the cohort declines in future years because of mortality factors, the loss is tempered by a continuing net flow of immigrants. By 2030, almost 10 percent of all "senior boomers" will be foreign-born. This shift in the share of people in a cohort who are foreign-born can be important to business planners and social service providers because foreign-born individuals may have different needs, attitudes or expectations than the U.S.-born population.

The impact of immigration on the baby-bust cohort (born between 1970 and 1979) is even greater. In that decade, fertility was low and levels of immigration had begun to increase substantially. Indeed, immigration is so prominent that the baby-bust cohort will actually *increase* in size between 1990 and 2010. By 2010, when members of the baby-bust generation will be between 30 and 39 years old, close to 19 percent of this age group will be foreign-born, in contrast to 5 percent of baby boomers at the same age. By 2050, when the baby-bust generation has reached its older years, 22 percent will be foreign-born.

Immigration also will have a significant effect on the racial and ethnic

Figure 4

Projected Size of Baby-Boom and Baby-Bust Cohorts by Place of Birth, 1990-2050



Source: Authors' analysis of U.S. Bureau of the Census, *Current Population Reports*, P-25, no. 1018 (Washington, DC: GPO, 1989).

diversity of the population, particularly on the baby-bust generation. As increasing numbers of immigrants come to the United States from Asia and Latin America, a greater share of the overall population will be comprised of Asians, Hispanics, and other minorities, especially among the younger age groups. This change will infuse greater diversity into every aspect of U.S. society from entertainment and culinary styles to schools, politics, the labor force, and business markets.

Continued high levels of immigration will more than offset any effects of the baby bust toward slower population growth. The nation's population should pass 272 million by the turn of this century and reach 327 million 50 years later. It could easily surpass 350 million in 2040 if recent increases in fertility are maintained and if immigration levels expand in response to legislation enacted in 1990. Some experts consider the official Census Bureau projections far too conservative. Demographers Dennis Ahlburg and James Vaupel, for example, foresee a potential for the U.S. population to reach 811 million by 2080 if mortality rates continue to decline at current rates, fertility follows the previous pattern of boom and bust cycles, and immigration rises to between 1 and 2 million people per year.[21] The implications of such alternative (and perhaps somewhat extreme) scenarios are quite dramatic. Still, no one is yet prepared to rule out these alternatives entirely since the assumptions, taken one at a time, are not far-fetched. Indeed, they help illustrate the tremendous power of demographic events in shaping the needs and future course of U.S. society.

The Baby Boom at Midlife

While it is important to understand the social, economic, and demographic dimensions that created the baby boom, current interest in this giant generation focuses on how well it is faring and what further impact it will have on the future of American society. Answers to such questions depend in large part on how you define the baby boom.

All too often writers and analysts tend to treat the baby-boom generation as a monolith. The fact that it spanned nearly 20 years (1946-1964), accounts for more than 80 million people, and represents one-third of the entire U.S. population today suggests that such simplistic approaches will yield only the most gross and misleading generalizations. For example, individuals born in the early years of the baby boom (say,

Northwestern University Archives

College enrollments doubled between 1965 and 1975.

1946 to 1954) confronted a far different set of circumstances than those who came later (1955-1964). Similarly, the experiences of baby-boom men were different from those of baby-boom women; likewise, those of minority baby boomers differed from the majority white baby boomers. While there may be some commonalities that bind the members of the baby-boom generation into a cohesive unit, the diversity that exists *within* the baby-boom generation is becoming increasingly apparent as its members head into middle age. How these individuals fare and their impact on the changing nature of social, economic, and political institutions will be addressed in the sections that follow.

Education

Perhaps more than any other institution, education has borne the brunt of changing patterns of U.S. fertility. In order to provide universal education, schools must expand when the number of births rises and generally retrench as numbers fall. During the 1950s and 1960s, enrollments soared as the baby-boom cohort entered school. The elementary school-age population (ages 5-13) grew from 23 million in 1950 to 37 million in 1970. Shortages of teachers and classrooms plagued elementary schools as early as the mid-1950s, forcing them into double and even triple sessions. By the early 1960s, secondary schools were faced with similar problems.

Colleges were next. Enrollments began to skyrocket in the mid-1960s, both from the sheer numbers of baby boomers and from the increased proportion of young people going to college. In the 1950s, only about 10 percent of young adults (ages 25-29) had completed at least four years of college. By 1970, that proportion had grown to 16 percent, and by 1980, to 23 percent. College enrollments leaped from about 3 million in 1957 to 11 million in 1975.[22] This dramatic demographic shift along with other factors—most importantly, an unpopular war—helped fuel the student unrest of the 1960s and 1970s.

Despite the turmoil created by the need to accommodate massive numbers of young people into existing educational systems, the baby-boom generation nevertheless became the most highly educated generation in American history. Approximately one in four baby boomers has completed four or more years of college compared with one in five Americans ages 45-54. What is more, the proportion who have less than a high school education also declined (see table 1).

But the biggest changes in educational attainment are seen by comparing differences by gender and by race. Whereas higher education was once regarded as an opportunity largely available to men, baby-boom women made important gains that narrowed the educational gap. The difference between the proportion of men and women who held college degrees in 1990 declined from a nine percentage point gap for pre-baby boomers (ages 45-54) to only four percentage points for baby boomers (ages 25-44).

On the other hand, despite the educational advances made by African Americans, the gap between black and white educational levels remains stubbornly unshaken. The proportion of African Americans who have less than a high school education, for example, fell dramatically among black baby boomers when compared with older blacks. Less than one in five African Americans born during the baby-boom era is without a high school diploma compared with more than one in three older blacks (ages 45-54). Yet blacks of both generations remain twice as likely as their white counterparts to lack a high school diploma. Similarly, an increasing share of African Americans in the baby-boom generation earned college degrees, but again the gap between blacks and whites remained constant. In 1990, 15 percent of black baby boomers (ages 25-44) had completed four or more years of college compared with 11 percent of pre-baby boomers (ages 45-54). The gap, however, between black and white college graduates remained at 13 percentage points for both generations. While new educational opportunities were opening up for minorities during the 1960s and 1970s, they simply kept pace with the gains made by whites.

Demographic shifts and a changing economy have set new expectations for educational achievement. While schools expanded to meet the growing demands of the baby-boom generation, the declining birth rates of the 1970s led to retrenchment of educational programs. With fewer young people in the population, many communities faced an excess number of teachers and unused classroom space. Today, another turnabout is underway. After years of stable or declining school enrollments, the school-age population is expected to grow by about 8 percent during the 1990s as the baby-boom's offspring fill elementary and secondary schools across the country.[23]

Yet current educational indicators suggest that the legacy of the baby boom—the broadening of educational attainment levels—could be slowly eroding. Today, nearly one-quarter of all young people (ages 18-24) have yet to

Table 1

Educational Attainment by Selected Characteristics, 1990

	Percent			
Characteristic	Less than high school	High School graduate	Some college	College graduate
All Baby Boomers (ages 25-44)	13	40	22	26
Age				
18-24	23	42	27	8
25-34	14	41	22	24
35-44	12	38	22	27
45-54	20	41	17	22
Men				
18-24	26	41	26	7
25-44	14	38	21	27
45-54	20	36	17	27
Women				
18-24	20	42	29	9
25-44	12	41	22	23
45-54	20	45	17	18
Whites				
18-24	19	43	30	9
25-44	9	40	23	28
45-54	15	43	18	24
Blacks				
18-24	30	45	21	4
25-44	18	44	23	15
45-54	36	38	15	11

Note: Percentages may not add to 100 because of rounding.
Source: PRB tabulations of the March 1990 Current Population Survey.

complete high school. While many of these individuals will eventually receive a high school diploma and even go on to earn college degrees, current data portend that their educational completion rates may not match those achieved by members of the well-educated baby-boom generation.

Marriage and Families

The leading edge of the baby-boom generation reached young adulthood during the social and sexual revolution of the 1960s. They helped change society's unwritten rules regarding courtship, marriage, and family formation. As a group, baby boomers tended to marry later in life, end marriages more frequently, delay childbearing, and have fewer children. But despite the popular portrayal of baby boomers as a generation inclined to "do its own thing" and reject social norms, a closer look at their marriage and family patterns today reveals that baby boomers have tended merely to postpone entry into various phases of the life cycle rather than completely reject them.

Marital Status

Baby boomers have delayed entry into marriage and are more likely to dissolve a marriage than were previous generations. Both developments are indicative of how baby boomers followed a different course than did their parents.

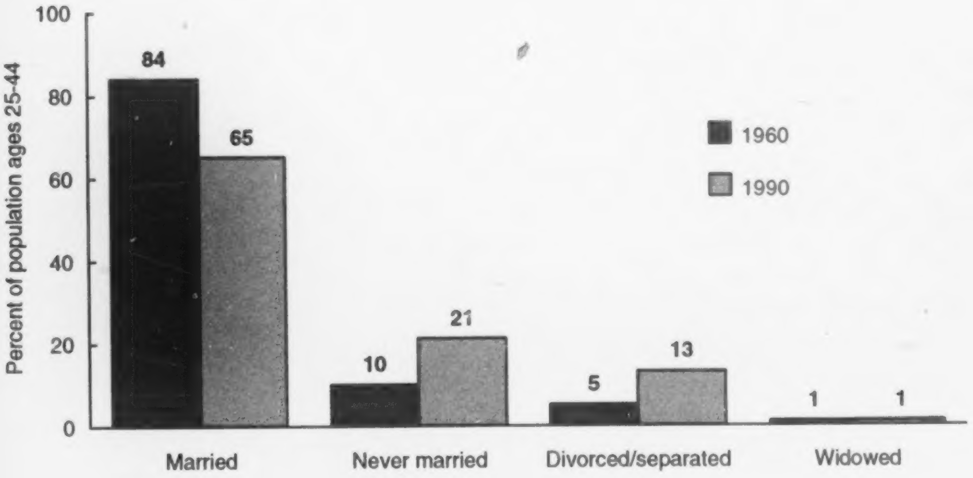
In 1960, the median age of first marriage for women was 20.3. By 1975 it had risen to 21.1. For men, median age at first marriage rose from 22.8 in 1960 to 23.5 in 1975.[24] In an era of women's

Cleo Photo

Nearly 30 percent of all births in 1988 were to women age 30 and older.

Figure 5

Marital Status of Population Ages 25-44, 1960 and 1990



Source: U.S. Bureau of the Census, *Current Population Reports*, P-20, no. 450.

A snapshot of the marital status of baby boomers in 1990 reflects a pattern quite different from their counterparts in the 1960s.

liberation, changing sexual mores, and greater tolerance for nonconforming behaviors, the norm for early age at marriage weakened. On the other hand, some researchers now regard the marriage and family patterns of the 1950s and early 1960s to be demographic aberrations and the rising age at first marriage is seen as a return to historic, long-term trends of social change.[25] Whether baby boomers forged new ground or returned to former patterns of social behavior is, of course, a matter of debate. Nonetheless, the trend toward an older age at marriage that began in the 1960s continues. In 1990 the median age at first marriage for women was 23.9; for men 26.1.[26]

The 1960s also marked the beginning of a sharp increase in the divorce rate. Initially, the growing number of divorces in the early 1960s occurred among older couples (age 45 or older), not to baby boomers. But by the 1970s, three of every four divorces were to people in their 20s and 30s—that is, the baby boomers.[27] The number of divorces passed the 1 million mark for the first time in 1975 and the divorce rate hit an all-time high of 5.8 divorces per 1,000 marriages in 1979. Although the divorce rate declined to 4.7 by 1988, about 60 percent of first marriages are now likely to end in divorce.[28]

This high level of marital instability challenged old norms and created new patterns of family life. A snapshot of the marital status of baby boomers in 1990 reflects a pattern quite different from their counterparts in the 1960s. Among the baby-boom generation, nearly two-thirds are married, one in eight are currently divorced and one in five have never married. This pattern is far different from the marital status of young adults (ages 25 to 44) 30 years ago (see figure 5).

But this general picture of the baby boom today masks real differences that are present within the giant generation itself. For example, nearly three-quarters (72 percent) of the older baby boomers (ages 35-44) are currently married, while just under 60 percent of the younger boomers (ages 25-34) are married. Likewise, only 11 percent of older boomers have never married compared with 30 percent of the younger boomers.[29] While a greater proportion of people are remaining unmarried than in previous generations, this trend hardly signals the end of marriage as an institution. As the younger boomers grow older, many will eventually marry and follow the pattern of their older peers.

Furthermore, there are substantial differences within the generation along lines of race and gender. Two-thirds of white baby boomers are currently married, whereas less than half (43 percent) of black baby boomers are. Almost twice the percentage of black boomers (36 percent) as white boomers (19 percent) have never married. Similarly, baby-boom women are more likely than baby-boom men to be married or divorced. One in four baby-boom men never married compared with only one in six baby-boom women.

Children and Family Size

In addition to delaying marriage, baby boomers postponed having children. Birth rates began to plummet in the mid-1960s just as baby-boom women began to enter the prime childbearing years. By the mid-1970s, birth rates sank to record lows. Baby boomers, however, were merely delaying parenthood, not foregoing it. As the leading edge of the baby boom nears the end of its childbearing years, the vast majority of these women will have borne a child, but their completed families will be smaller than those of their parents' generation. Whereas nearly 60 percent of women born between 1930-1935 had three or more children by the time they were ages 35-39, the most common pattern for baby-boom women of this same age group was to have two children (see figure 2, page 5). Thirty-

Nearly half of all couples who married in the mid-1980s had cohabited.

Box 2

Cohabitation and Moving Back Home

Prior to 1960, most young adults lived in their parent's home until they got married. The social and sexual revolutions of the 1960s indelibly changed this pattern.

During the 1960s, society's strict disapproval of unmarried men and women living together weakened. The fear of having a child out-of-wedlock was greatly reduced by the introduction of the birth control pill, and the changing sexual mores of the times encouraged many young men and women of the baby-boom generation to live together before marriage. Only 8 percent of first marriages in the late 1960s were preceded by cohabitation, but nearly half of all couples who married in the mid-1980s had cohabited.[1] The number of cohabiting couples doubled between 1960 and 1977 from fewer than 500,000 to almost 1 million and grew rapidly from that time (see figure). Most of this sharp increase reflected the behavior of people under age 25.

In 1990, 2.9 million households consisted of unmarried adults living together. Over half (58 percent) were baby boomers (ages 25-44) and another quarter (28 percent) were persons under age 25. Persons who had never married made up the largest share of cohabiting partners, followed by those who had been divorced. Nearly one-third of these households had children under age 15.[2]

While older baby boomers seemed to rush to establish households of their own, younger baby boomers appear to be more hesitant about leaving their parental home. Twelve percent of young adults ages 25-34 (the youngest baby boomers) were living in their parents' home in 1990. Ten years earlier (in 1980) when the oldest baby boomers were in this age group, only 9 percent lived with their parents.[3] The vast majority (80 percent) of today's young baby boomers who live with their parents have never married. About 13 percent have children of their own.

Stretching out the process of leaving the parental home has been attributed to the difficult economic circumstances that younger baby boomers face today. Since the 1970s, general inflationary pressures, the rising cost of housing, slower wage growth, the increased cost of higher education, and the repayment of (often large) student loans are seen as important factors that impede younger baby boomers from establishing their own households.

five percent of women born between 1947-1953 had borne two children by 1988. Indeed the childbearing patterns of these older baby-boom women is more reminiscent of their grandmothers than their mothers.

Household Formation and Housing

There were 93 million households in the United States in 1990, 30 million more than in 1970. This represents almost a 50 percent increase in just 20 years. During the same period, the U.S. population grew by 22 percent.

The coming of age of the baby-boom generation accounts for much of the increase in the number of households formed between 1970-1990, but this fact explains only part of the growth. Other demographic factors also contributed to the gain. Fewer young married couples resided with their parents. The increasing incidence of divorce often turned one household into two. One-parent families became more common, and more single adults left their parental home to set up households of their own. The wide array of living arrangements evident today reflects both the lifestyle choices and economic circumstances of the baby boomers as they enter midlife (see box 2).

For now, the trend is relatively modest, but there is a similar pattern among the first members of the baby-bust generation (that is, persons ages 18-24). More young people are living at home with their parents, more are living alone or sharing their home with a roommate or partner, and fewer are maintaining married-couple, family households of their own. Although it is too early to predict with much certainty the future course of the maturing baby-bust generation, current data suggest that they are likely to follow the diverse patterns of housing and living arrangements that evolved from the social changes of the 1960s tempered by the economic realities of the times.

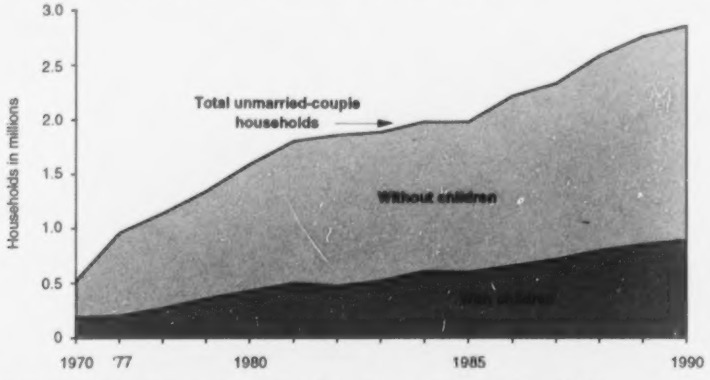
Reference

1. Larry L. Bumpass, "What's Happening to the Family?" *Demography* 27 (November 1990): 486.

2. U.S. Bureau of the Census, "Marital Status and Living Arrangements: March 1990," *Current Population Reports* P-20, no. 450, table O.

3. *Ibid.*, tables J and 7.

Unmarried-Couple Households, 1970-1990



Source: U.S. Bureau of the Census, *Current Population Reports*, P-20, no. 45, table N.

Table 2

Marital Status and Living Arrangements of Baby Boomers, 1990

	Percent				
	Married with children	Married without children	Single parent	Unmarried, living alone	Unmarried, living with others
All Baby Boomers	50	15	7	9	19
Age					
25-34	44	15	7	9	25
35-44	57	15	8	8	12
Gender					
Men	49	14	2	11	24
Women	51	15	12	7	15
Race					
White	52	16	5	9	17
Black	33	10	19	9	29

Note: Percentages may not add to 100 because of rounding.
Source: PRB tabulations of the March 1990 Current Population Survey.

Lisa Youngblood

Affording a home has been particularly difficult for single parents, minorities, and younger boomers.

In 1990, half of all baby boomers were married and had minor-age children, 15 percent were married but without children, and 7 percent were single parents. Most unmarried baby boomers lived with other individuals—parents, roommates, significant others—while 9 percent lived alone (see table 2). This composite picture of the baby-boom generation, however, masks many differences by age, gender, and race. For example, the living arrangements of younger and older baby boomers reflect their propensity to postpone marriage and childbearing. Older baby boomers are about 30 percent more likely to be married with children than are younger boomers. Conversely, one in three younger boomers is unmarried and living alone or with others, but only one in five older boomers shares this lifestyle. Gender differences are particularly stark in terms of single-parenting. Approximately one in eight baby-boom women heads a single-parent household compared with one in 50 baby-boom men. Black baby boomers are 60 percent less likely than white baby boomers to be married and almost four times more likely to be single parents.

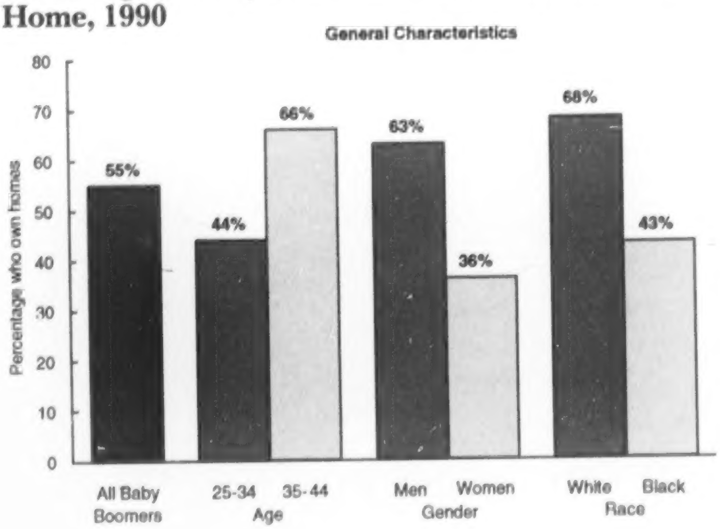
These characteristics have particular significance for the housing industry. They help determine both the number and type of housing units needed to shelter America's population. Because of its size and age, the baby-boom generation now dominates a large segment of the housing market.

Indeed, the number of new homebuyers was a prime factor in pushing up the cost of housing in the late-1970s and 1980s. Thirty-two million Americans reached age 30 (a typical age for purchasing a first home) during the 1970s, and another 42 million turned 30 during the 1980s. Spiraling home prices, along with soaring energy costs and the declining value of the U.S. dollar, helped unleash an inflationary spiral.[30] Homeownership became more than a symbol of the American dream; it also provided a hedge against inflation.

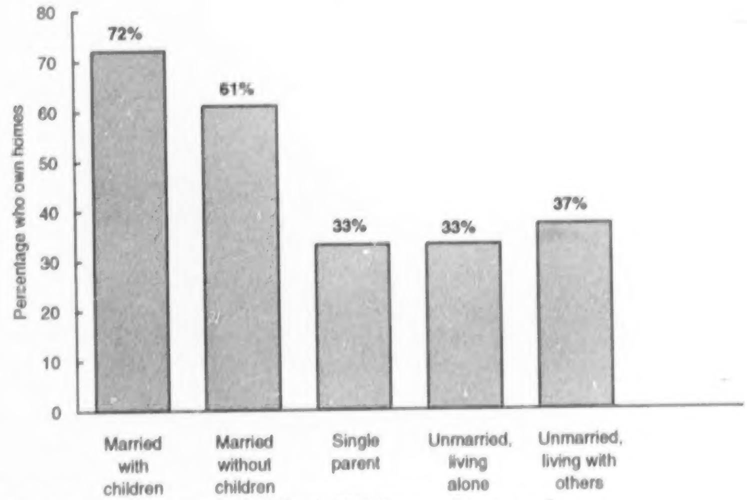
By 1990, more than half (55 percent) of all baby boomers owned their own home. But the patterns of homeownership are not uniform across this giant generation. Instead, they reflect the weaving of demographic patterns and economic fortunes.

Figure 6

Percentage of Baby-Boom Householders Who Own a Home, 1990



Marital Status and Presence of Children



Source: PRB tabulations of the March 1990 Current Population Survey.

Not surprisingly, homeownership increases with age (see figure 6). Two-thirds of the older baby boomers owned a home in 1990, while less than half (44 percent) of younger boomers had made the investment. Baby-boom men were about 40 percent more likely to own a home than were baby-boom women. Similarly, homeownership among whites was much higher than among blacks.

An even greater contrast, however, can be seen by marital status and presence of children. The spiraling cost of housing during the 1970s and 1980s meant that it often took two incomes rather than one to purchase a home. Among baby boomers who were married and had children, three of every four owned a home in 1990. The rate of homeownership for couples without children was somewhat lower. In contrast, only one in three unmarried baby boomers owned a home.

Compared with their counterparts in the 1960s, baby boomers in 1990 were far less likely to own a home.[31] Whether escalating prices have pushed homeownership beyond the financial reach of many individuals in the baby-boom generation or whether this is one more example of how baby boomers are postponing life-cycle events is not known at this time. The coming decade will reveal, of course, how quickly and how completely baby boomers are able to make up for these lagging rates of homeownership.

Baby-boom women have been at the vanguard of changes in the labor force.

The future of housing demand is, at best, uncertain. Some economists foresee continued softening of housing prices and an easing of demand as the small baby-bust generation enters the housing market.[32] Others predict continued high demand as the younger and more numerous portion of the baby-boom generation enters its family formation stage during the 1990s.[33] Whether demand and prices rise or fall will of course depend on both economic and demographic factors. Nonetheless, shifting demographic numbers and changing lifestyles make the housing market much more diverse and segmented than in the past. Accommodating this diversity will be a major challenge to the housing industry in the decades ahead.

Labor Force and Employment

The entrance of the baby-boom generation into the labor force led to an interesting paradox. It greatly expanded the size of the labor force by putting more people to work than ever before, but it also helped worsen unemployment rates. By March 1980, the total work force was 104.1 million. Some 97.7 million people were employed; 6.4 million were out of work.

This paradox led to interesting political exchanges. During the 1980 presidential campaign, challenger Ronald Reagan argued that the number of unemployed people had increased during the Carter years. President Jimmy Carter pointed out that more people were working during his administration than ever before in history. Not knowing who to believe, many voters took this exchange as mere campaign rhetoric.

Both candidates were correct. As the baby boom arrived at working age, the U.S. labor force began to swell, adding 2 million new workers per year between 1968 and 1980. Most of these new workers were teenagers and young adults. By 1978, nearly 10 million 16- to 19-year olds were working or looking for work—about 5 million more than in 1960. At the same time, the U.S. economy needed to generate new employment opportunities for this growing group of workers. Between 1973 and 1977, 10 million new jobs were created, but this was not enough to absorb all of the baby boomers who had entered the labor market. The number of unemployed workers grew by 2 million over the same four-year period.[34] Younger workers often need more time to find a job, and they switch jobs more often—consequently, they register high unemployment rates. Inexperienced workers, along with a sluggish economy, helped to force up the unemployment rate.

The maturing of baby-boom workers helped lower the unemployment rates in the 1980s. By the year 2000, over half of all workers will be between the ages of 35 and 54—a time of life when most workers are considered to be at the peak of their productivity.[35] As the baby boom settles into middle age and the smaller baby-bust cohort enters the work force, demographic factors suggest a favorable scenario for lowering unemployment rates during the 1990s relative to what they might have been with a "younger" work force.[36] A sluggish economy, however, could dampen the demographic effect.

Besides affecting the size of the labor force, the baby-boom generation also affected its composition. White male workers who formed the majority of the work force in 1960 now represent less than half of all workers. Women and minorities not only represent a majority of today's work force, but are expected to account for over 80 percent of net new labor force growth during the 1990s.[37]

Baby-boom women have been at the vanguard of this change. Their increased levels of education, postponement of marriage, greater propensity to divorce, as well as inflationary pressures on family budgets, drew these women into the work force. In 1990, 75 percent of baby-boom women (ages 25-44) were in the labor force. Twenty years earlier, just under half of their counterparts were working outside the home. Furthermore, the vast majority of women in today's labor force are full-time, career-oriented workers.[38]

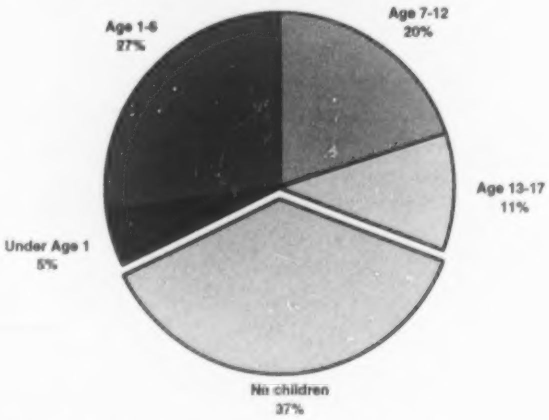
The increased labor force participation of married women is particularly remarkable, especially for women with preschool-age children. In the past, these women were least likely to be employed outside the home. But since 1965 the most rapid increases in rates of labor force participation have been among women with children under six years of age.

Almost two-thirds of all baby-boom women who worked outside the home in 1990 had at least one child under age 18 (see figure 7). Approximately one-third had a child age six or younger and another third had children who were of elementary- or secondary-school age. Five percent of employed baby-boom women had an infant under age one.

The likelihood of combining the responsibilities of job and family is somewhat greater for older baby-boom women than for younger boomers. Two-thirds (66 percent) of the older baby-boom women (ages 35-44) in the labor force had children, compared with 60 percent of younger baby-boom women (ages 25-34). Delayed marriage and childbearing patterns account for much of this difference. Most of the younger baby boomers (43 percent) had preschool-age children, while nearly half (47 percent) of the older baby-boom women had elementary and secondary school-age children. Given these demographic and labor-force patterns, work-family issues, such as parental leave and child care, are likely to remain high on the public policy agenda for the coming decade.

Figure 7

Baby-Boom Women in the Labor Force by Age of Youngest Child, 1990



Source: PRB tabulations of the March 1990 Current Population Survey.

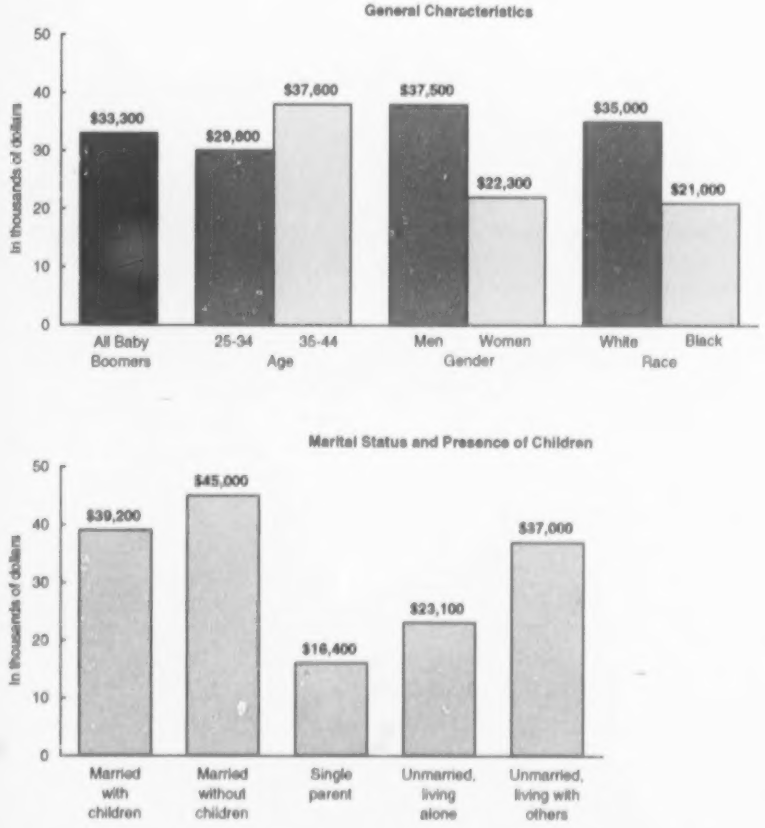
Income and Poverty

Perhaps the most common portrayal of the baby-boom generation is that of a group of individuals who grew up in relative affluence, embraced an antimaterialistic, counterculture persona during the 1960s, and are now driven by the need to acquire and maintain a highly visible consumer-oriented lifestyle. Terms such as "hippie," "yuppie" (young, upwardly mobile, urban, professional), and "dink" (dual-income couples with no children) have been used to characterize the social and economic lifestyle of the entire generation. Although many baby boomers indeed fit these stereotypical images—given the large numeric size of the baby-boom generation, it is easy to find large numbers to fit almost *any* stereotype—such images do not reflect the actual diversity that exists within the crowded generation.

A snapshot of the current income status of the baby-boom generation places it somewhat above the average for the U.S. population as a whole. Median income for households headed by a baby boomer (ages 25-44) in 1989 was $33,300, while for all U.S. households it was $28,900. But such figures mask the differences in income level that are evident for subgroups within the baby-boom generation (see figure 8). The median income for a household headed by a baby-boom woman is only 60 percent that of a household headed by a baby-boom man. Likewise, households headed by an African-American baby boomer have a median income only 60 percent as high as their white baby-boomer counterpart. The most dramatic difference, however, is the stark contrast found by marital status and presence of children. Single-parent households have a median income that is less than half that of married couples with children. Indeed, the median income for baby boomers who are single parents is the lowest of any group within the giant generation.

Figure 8

Median Income of Households Headed by a Baby Boomer, 1989



Source: PRB tabulations of the March 1990 Current Population Survey.

Ten percent of all households headed by a baby boomer were living below the U.S. poverty line in 1989. Another 7 percent of households were considered near poor—that is, within 150 percent of the poverty threshold. As suggested by the median income figures, households headed by baby-boom women and blacks are at much greater risk of being poor than are households headed by men or whites. Whereas 7 percent of households headed by baby-boom men are poor, 12 percent of households headed by baby-boom women live in poverty. Households headed by African-American baby boomers are three times more likely to be poor than are households headed by whites—22 percent vs. 7 percent, respectively.

Differences in education, occupation, employment and earnings affect these income measures, but a recurring question is whether the baby-boom generation is doing as well financially as their parents' generation. Work by economists Frank Levy and Richard Michel shows considerable inequality both between generations and within the baby-boom generation itself.[39] A sluggish national economy, stagnation in men's wages, and a slowdown in the growth of net wealth are among the primary reasons given for widening income and wealth disparities. Earnings projections for high school-educated fathers and sons show that the future earnings of today's 30-year old will just about equal his father's peak earnings under a scenario of improved national productivity. If productivity remains at current levels of growth, the son's peak earnings will be about 20 percent less than his father's. Projections for college-educated fathers and sons are somewhat more optimistic. The earnings of college-educated sons will, on average, exceed those of his college-educated father, but since these calculations are based on averages, not every son will be as fortunate as his father. While upward mobility still exists, Levy and Michel caution that it is harder today for a young man with only

War is not healthy for Children and other living things

Northwestern University Archives

Political activism of older baby boomers has given way to political apathy of younger boomers.

a high school education to earn his way into the middle class.[40]

As already noted, many baby boomers have delayed marriage, postponed childbearing, limited the size of their families, and come to rely on two earners, rather than one, in the labor force. In short, they have adapted demographically to the less favorable economic circumstances of the 1970s and 1980s. The idealized model of a married-couple household with the husband as sole breadwinner simply does not represent the majority of baby-boom households. Studies of earnings and income potential will need to take into account the labor force participation and earnings of women as well as those of men. Nonetheless, given the tenuousness of marriage and the uncertain outlook for future economic performance, the relative status of the baby-boom generation vis-à-vis their parents remains in doubt. What seems most apparent is that diversity and contrasts within the baby-boom generation are likely to grow.

Political Participation

For years, political analysts and pollsters have looked at the giant baby-boom generation and assumed that one day it will be a powerful political force. Images of the political activism of the leading-edge baby boomers in the 1960s and early 1970s are seen as signs of future political clout. And, their ever-present numbers remind us that the baby-boom generation could be a force to be reckoned with. Political pollster Patrick H. Caddell has observed, "If they [the baby boomers] were all to enter the political system tomorrow and were willing to dispose one way or another . . . they would totally turn the political system upside down."[41]

But the cohesion and clout that has been attributed to the giant generation has never materialized or, if it has, it produced some surprising results. "Few would have predicted that a generation popularly characterized as the flower children, antiwar demonstrators, and civil rights activists of the 1960s would cast the majority of their votes for Ronald Reagan."[42]

What is often overlooked in discussions of contemporary political behavior is that the baby-boom generation is really a composite of several political generations, not one. For the oldest members of the baby boom, their first politically salient memories were of school desegregation struggles, the election of John F. Kennedy to the presidency, the assassinations of John and Robert Kennedy and Martin Luther King, and the build up of American forces in Vietnam. For younger baby boomers, political awareness was framed around the conflict and controversy that surrounded the Vietnam War, the Watergate Hearings, the resignation of President Richard M. Nixon, oil embargos, and the election of Ronald Reagan to the presidency. Older baby boomers cut their political teeth during a time of government activism and optimism; younger baby boomers entered politics during a time of government retrenchment and public cynicism and apathy.

The influence of these events is hard to separate from the effects of age on voter participation rates. Younger people are less likely to vote than older people. This suggests that as members of the baby boom age, more of them will actually go to the polls and vote. However, the percentage of people who vote in national elections has been declining since the 1970s, and this may present a countervailing trend. As table 3 shows, the leading-edge baby boomers at every age have been more likely to vote than the younger, trailing-edge boomers. In 1972, half of all persons ages 18-24 (the leading-edge baby boomers) voted. By 1980, when the trailing-edge boomers were in this age group, only 40 percent cast ballots. In contrast, 55 percent of the leading-edge boomers voted in the 1980 presidential election. By 1988, the gap between leading-edge and trailing-edge baby boomers had decreased slightly, but voting trends suggest that it is the younger members of the generation who remain outside the political system.

In 1990, the baby-boom generation (ages 25-44) represented 44 percent of the voting-age population. However, given the diversity of the generation in terms of age, race, ethnicity, household and family patterns, education and income levels, it is difficult to foresee a unifying issue or event that could galvanize this entire generation into a single voting bloc. During the 1990s, younger baby boomers who are beginning their families may focus their attention on the affordability of housing and work-family issues such as

Table 3

Percentage of People Who Reported Voting by Age, 1964-1988

	Ages					
Year	18-24	25-34	35-44	45-54	55-64	65+
1964	51*	65	73	76	76	66
1968	50*	63	71	75	75	66
1972	50	60	66	71	71	64
1976	42	55	63	68	70	62
1980	40	55	64	68	71	65
1984	41	55	64	68	72	68
1988	36	48	61	67	69	69

*Prior to 1972, voting age was 21 and older in most states.

☐ Older baby boomers, born 1946-1954

▨ Younger baby boomers, born 1955-1964

Source: U.S. Bureau of the Census. "Voting and Registration in the Election of November [year]," *Current Population Reports*, P-20, various issues.

child-care or parental-leave policies. Older baby boomers, on the other hand, may be more concerned with the costs of obtaining a college education for their children or providing long-term care for their aging parents. Indeed, it is the aging of the baby-boom generation that will add to the voting strength of the older population, give greater prominence to age-related issues, and help set the national agenda for policies that will affect the nation's older citizens.

Prospects for the Future

No crystal ball can tell us what the future holds. Speculation and debate have begun to mount, however, over the prospects of the baby-boom generation as it enters middle age and faces a future of growing old. Some see the decades ahead as a time of renewed productivity and economic growth. Others see ominous signs of a nation facing increasing social expenditures and a possible shortage of workers. Whether one approaches the future optimistically or with a jaundiced eye, there is no way to ignore the fact that the baby-boom generation occupies the center of this maelstrom.

Both the individual members of the baby boom and the nation as a whole are aging. As baby boomers become "senior" boomers, the number of older people in the population will double. By 2030, when the oldest surviving baby boomers will be age 84 and the youngest will be age 65, there will be 65 million people age 65 and older. This compares with roughly 30 million senior citizens today. One in five Americans will be over the age of 65 in 2030—up from one in eight today. Increased longevity already is swelling the ranks of the oldest-old, that is, individuals age 85 and older. Between 1990 and 2030, the number of people age 85 and older will triple, accounting for more than 8.6 million people. This will occur even *before* the baby boom enters the very oldest stages of life.

But the aging of the baby boom (and the United States) implies more than a simple increase in the size of the older population. The median age of the population is gradually increasing and the relative size of the younger age groups vis-à-vis the older age groups is gradually decreasing. By 2030 there will be more Americans over the age of 65 than under the age of 18, according to current projections. This decline reduces the number of younger working people who will be available to support the growing number of older retirees.

These demographic trends raise important public policy questions regarding how we will support the needs of a growing older population and how we will structure policies to assure a fair and equitable distribution of resources for all age groups. The sections that follow provide a demographic base for framing these issues.

Demographic trends raise important questions of how to support a growing older population and how to assure a fair and equitable distribution of resources.

Aging of the Work Force

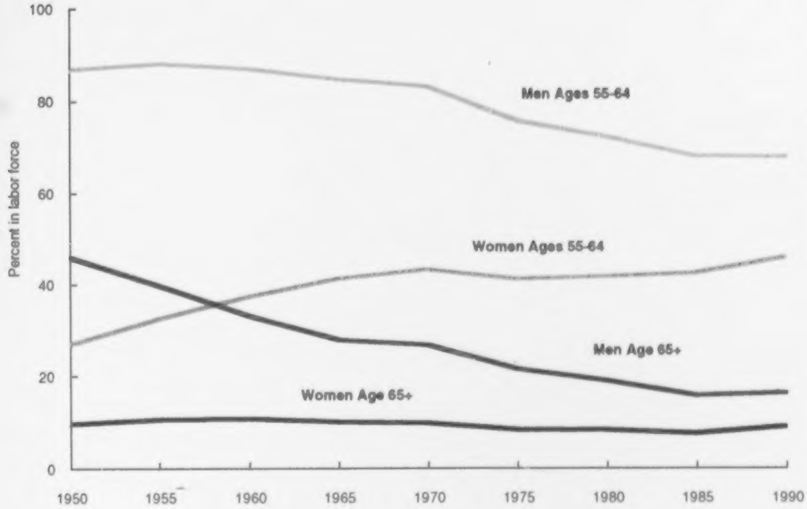
Demographic and labor force projections show a gradual maturing of the U.S. labor force over the next several decades. This has raised some concern over the vitality and productivity of the work force.

The aging of the work force is caused primarily by the aging of the baby-boom generation. By the year 2000, baby boomers will account for more than half of all workers, and this will raise the median age of the work force to 39, compared with 36 today. But this change is not unprecedented. The median age of the post-World War II labor force peaked at age 41 in 1962. If members of the baby-boom generation follow current work-retirement patterns, the median age of the future labor force is not expected to exceed 1962 levels.[43] Concern that the aging of the work force will inhibit economic productivity may therefore be unwarranted. Furthermore, the declining number of younger workers in the population may create a new demand to retain, recruit, and retrain older workers.

But an increasing number of older workers could affect the career and job mobility of younger workers, as well as labor costs. The career advancement and promotional opportunities of younger baby boomers (and members of the smaller baby-bust generation)

Figure 9

Older Workers in the Labor Force, 1950-1990



Source: U.S. Department of Labor, *Handbook of Labor Statistics*, 1989, table 4.

may be stymied as long as the older baby boomers remain in the labor force. Furthermore, older workers generally cost employers more than do younger workers. Because salaries and benefits tend to increase with years of experience and seniority within a firm, employers sometimes view older workers as too expensive to retain. Many managers also believe that older workers are slow to adapt to new ways and new technologies. A 1989 survey sponsored by the American Association of Retired Persons found that only one in four senior managers expressed a "commitment" to workers who were over age 50.[44]

Most analysts agree that age alone is a poor criterion for determining employment status. Age-based policies ignore individual differences, for example, penalizing a person who is younger than age 65 and who may have a genuine need to withdraw from the labor force or squandering the talents of an older person who might continue to make a valuable contribution to society. As members of the giant baby-boom generation enter into the category of "older worker," they will shape work-retirement policies and grapple directly with the concept and definitions of age discrimination.

Retirement Trends

While most people tend to regard age 65 as the "normal" age of retirement, nearly 60 percent of men and 70 percent of women now begin receiving Social Security benefits at age 62. More and more individuals are opting for early withdrawal from the labor force, and continuation of this trend will increase the number of older persons who will be outside the paid labor force. Labor force participation rates for older men, in particular, have declined dramatically (see figure 9). In 1950, 87 percent of men ages 55-64 worked, compared with only 68 percent in 1990. Participation rates for women ages 55-64, on the other hand, increased, but remain substantially below the rates of older men. Currently, just 12 percent of all persons age 65 or older work, even on a part-time basis.[45]

Decreasing labor force activity and increasing life expectancy suggest that future generations are likely to spend more years in retirement than previous ones. Looming large in this picture is the baby-boom generation which will begin to retire in significant numbers around the year 2010, if current patterns hold. How to provide financial support for these individuals is a crucial public policy question that seems to be operating on multiple fronts and sometimes at cross purposes.

The number of private pension plans, for example, has more than doubled in the past 15 years from 340,000 to over 870,000, and members of the baby-boom generation have benefited from this growth. Three of every five baby boomers (ages 25-44) in 1988 worked for an employer who sponsored a pension plan and nearly half of these individuals (48 percent) reported that they were fully vested in their plan (that is, they were entitled to future benefits from the plan).[46] Participation in private pension plans, however, was more common among men, persons who work for larger firms, and higher earners. Nonetheless, the growth of private pension plans has been a major factor in the trend toward early retirement. Even a small pension can induce an individual to retire, so the downward trend in the age at retirement is likely to continue.

While the presence of private pension plans may encourage some individuals to retire before age 65, Social Security policies were revised in 1983 with an eye toward keeping older workers in the workplace to ease the public costs of providing retirement income. Between the years 2000 and 2022, the age at which a worker will be able to retire with full Social Security benefits will gradually rise from 65 to 67.[47] Reduced benefits will continue to be available at age 62, but additional benefits will accrue to individuals who delay retirement up to age 70. This change will be phased in just as the large baby-boom generation approaches its retirement years.

For many members of the baby-boom generation, these competing trends in public and private policy will pose a dilemma in deciding whether to retire early or remain in the work force. Typically, Social Security represents the largest share of an older person's income with personal assets and private pension income representing significantly smaller shares. For example, the average older person in 1988 received 38 percent of his or her income from Social Security, 25 percent from assets, and 18 percent from private pensions.[48] Baby boomer's plans for a financially secure retirement, therefore, will need to take account of this mix of income sources.

Personal Saving Rates

To date, the baby-boom generation has been better known for its spending habits than its saving habits. Indeed, some financial analysts seem to hold the baby boomers responsible for the plummeting personal saving rate in the United States during the past 20 years. The U.S. personal saving rate rose from approximately 7 percent of an individual's after-tax income in the 1960s to a peak of 9.4 percent in 1973. Then, as the baby-boom generation assumed an increasing share of the income-earning population, the personal saving rate began a downward spiral, bottoming out at 2.9 percent in 1987. By the end of the decade, it climbed back up to 4.6 percent and has stayed at roughly this level for the past few years.

Some economists attribute the low overall saving rate (and high ratio of consumer debt to disposable income) to the fact that the baby-boom generation was at a stage in its life cycle when people tend to earn less, save less, and borrow more to start careers and establish homes and families. Accordingly, the saving rate is expected to rise during the 1990s as the baby-boom generation begins to plan for its retirement.

Two caveats to this scenario, however, must be kept in mind. First, there is always the possibility that a major economic disruption, such as a severe recession or sharply higher taxes, could overwhelm the demographic forces favoring higher saving rates. Second, the delayed childbearing patterns that the baby-boom generation has followed means that many baby boomers will be paying for their children's college education just at the time when they might otherwise be saving for their own retirement. Without careful financial planning, many baby boomers could well find themselves with limited resources in their older years.

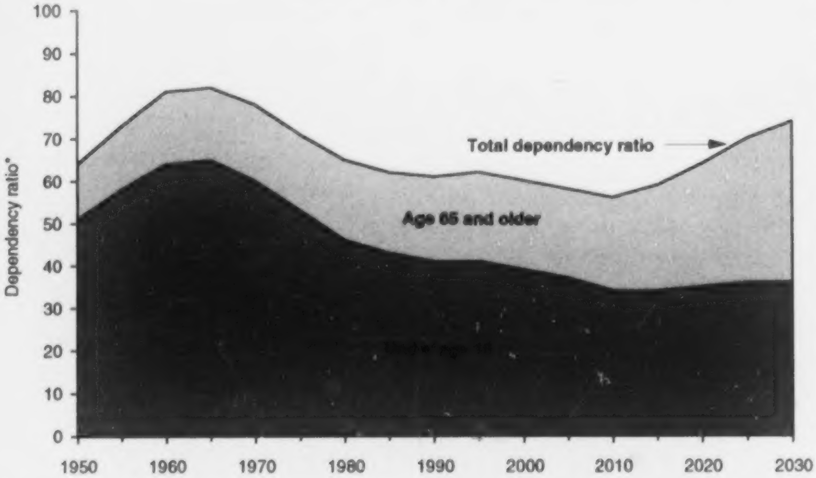
Baby boomers will be paying for their children's college education just at the time when they might otherwise be saving for their own retirement.

Social Security

The viability and solvency of the Social Security system is one of the most persistent public policy questions debated today. With the proportion of retirees to workers rising, there is concern that society will not be able to meet future Social Security obligations or will place an excessive burden on future taxpayers. In 1990, there were roughly five people of working age (ages 18 to 64) for every person age 65 or older. By 2030, the ratio will be three to one.

Focusing on the burgeoning older population overstates the problem and greatly oversimplifies the issue of age-dependency, some analysts contend.[49] The ratio of older persons to the working age population (typically called, the *aged dependency ratio*) is misleading because it does not take into account

Figure 10
Dependency Ratios for Children and Elderly, 1950-2030



* Number of persons under age 18 or age 65 and older per 100 persons age 18-64.
Source: U.S. Bureau of the Census, *Current Population Reports*, P-25, no. 1018, table E.

actual labor force participation rates and ignores the number of children in the population. If children are added to the dependency ratio, a somewhat different picture emerges (see figure 10). For the next 50 year, the *total dependency ratio* (that is, taking both children and elderly into account) does not exceed the level it attained in 1964 at the height of the baby boom.

What is at issue is the relative cost of supporting younger and older segments of the population and the sources of that support. Parents pay a large share of the cost of raising children, while state and local taxes are used to support education programs. On the other hand, most elderly services are funded through federal government programs and the personal resources of older people and their families. Estimating the "true" costs of supporting older versus younger people is hampered by a lack of adequate data to address this very complex issue. Nonetheless, the aging of the population and potential need to shift resources from the young to the old will renew debate on public versus private responsibilities, as well as the appropriate level of government to address these needs.

At least for now, long-range (75-year) forecasts by Social Security actuaries show the system is financially sound and currently accumulating a large surplus of funds that is intended to finance the baby-boom generation's retirement. But federal budget deficits and rising health-care costs pose significant threats to maintaining the program on its current course. Much of the surplus funds that are currently being accumulated is being borrowed by the federal government to offset the national debt. The long-run implications of this policy are still unknown, but preserving the solvency of the Social Security system may be one of the first major tests of the baby-boom generation's political cohesion and power.

Health Care

Although the majority of older people lead relatively healthy and independent lives, the risk of becoming functionally disabled and in need of assistance increases rapidly with age. Half of all persons age 85 or older who currently live in the community need assistance with very basic needs—eating, bathing, dressing, walking, or using the toilet. Providing services to this highly vulnerable population will be a major challenge in the years ahead. The aging baby-boom generation will first encounter this problem in regard to their own parents; later they will face the need for themselves.

Families are the mainstay of support for frail and disabled older people. Over 90 percent of older disabled people who live in the community rely, at least in part, on family and friends for care; 70 percent do so exclusively.[50] Seeking professional assistance is regarded as a last resort.

For older married couples, the spouse generally serves as the primary caregiver. But if the older person is not married, the role of caregiver is generally assumed by an adult daughter or daugher-in-law. Demographic trends, however, are creating significant tensions in this arrangement. Women's increased labor-force participation leaves them less time for family caregiving. Forty-four percent of adult daughters (or daughters-in-law) who care for an impaired parent are employed, according to a national survey on long-term care. Another 12 percent reported that they quit their job to provide care to an older person.[51]

More and more women of the baby-boom generation will face the demands and trade-offs of caring for an older relative in the decades ahead. The policies and support services that are formulated to meet this need will help shape the future structure of caregiving arrangements for the baby-boom generation itself.

But caring for the baby-boom generation may pose some additional challenges. Because the baby-boom generation has had relatively few children, compared with the current generation of elderly, the number of potential caregivers will be reduced. Furthermore, the increased incidence of divorce and remarriage, so common among baby boomers, is likely to create ambiguity over family roles. Will an adult child of divorce, for example, feel equal responsibility for providing support and assistance to both the absent parent and the custodial parent? Will adult step-children feel the same responsibility toward a step-parent as a child who was raised in a traditional two-parent home? Certainly, these situations are not entirely new; they have occurred in previous generations. But they will pose new challenges to society because they have never occurred in such massive numbers.

Conclusion

For the next 20 years, the baby-boom generation will be laying the foundation not only for its own retirement and older years, but also for the nation's future. Baby boomers will be entering their most productive work years and will dominate the work force for the next three decades. They will see their children grow and their parents age. And, both directly and indirectly, they will set the agenda for the nation's public policy choices in education, work-family policies, retirement programs, and health care.

The aging of the baby-boom generation will raise important questions concerning generational equity and fairness. How do we invest in America's future while meeting the social, economic, and political needs of today? In the decades ahead, the struggle over the allocation of scarce resources will almost inevitably be seen in terms of generational conflicts and tradeoffs. But the key challenge will be to recognize the interdependencies that exist between generations. As the generation in the middle, baby boomers will play a pivotal role in this debate as they provide for their children, assist their aging parents, and plan for their own futures. Whether the baby-boom generation remains politically silent, acts with one voice, or represents a spectrum of views on these issues remains to be seen. But given their size, perhaps no other generation in history has had (or will have) as much influence in determining the course of human events.

Cleo Photo

Intergenerational bonds remain strong for members of the baby boom.

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Discussion Questions

1. Explain how demographic, economic, social, and other factors contributed to the baby boom. In your opinion, which factors played the greatest role?

2. Discuss the Easterlin theory (see pp. 7-8). Do you agree with his conclusions? Do you think the size of your cohort will affect your future plans?

3. On page 17, the authors state that "some researchers now regard the marriage and family patterns of the 1950s and early 1960s to be demographic aberrations." Explain.

4. Give specific examples of how the sheer number of baby boomers have affected (and will continue to affect) services and markets in different areas of the country.

5. Select a few issues currently under political review. Speculate how baby boomers might vote on these issues and whether they could affect the outcome of these issues. Do the same thing for the selection of political leaders.

6. Describe the possible experiences of a young person today entering the labor force. Consider the availability of jobs, education and job skill requirements, prospects for career advancement, and other issues that person may face.

7. Explore the costs and benefits of an aging labor force for today's employer. Consider different types of industries.

8. By the year 2040, members of the baby-boom generation will be age 75 and older. How should baby boomers plan for these older years? As a member of the baby-bust generation (or a child of baby-boom parents), consider your possible role in this process. Consider employment options, retirement income, health care, and housing needs.

9. At what age do you think you will retire from the labor force? What are the advantages and disadvantages of this plan?

Prepared by Kimberly A. Crews

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The Challenge of World Health

by W. Henry Mosley and Peter Cowley

Abstract—Worldwide, average life expectancy at birth rose from 47 to 67 years between the 1950s and late 1980s. But these improvements were unequally shared. Over 300 million people live in countries where life expectancy is below 50 years and one of every 10 newborns dies before age one. Reducing these gross disparities, within as well as among countries, is the health challenge of the 1990s. And the priorities are very different in developing and developed countries.

UNICEF has led a worldwide effort to improve child survival through education, inoculation campaigns, and nutrition and anti-malaria programs. The percentage of children vaccinated against major diseases soared to nearly 80 percent in 1989, from about 15 percent in 1980. Yet, malnutrition—a contributing factor in up to 40 percent of child deaths—has limited the gains in child health.

Improved adult health in developed countries reflects lifestyle changes—less smoking and obesity, more exercise—as well as medical technology. But it is not clear whether the elderly are living healthier as well as longer lives.

In developing countries, unsanitary conditions and the effects of childhood illnesses may perpetuate major adult health problems, such as tuberculosis, liver cancer, and maternal mortality. Urbanization sometimes brings more accidental deaths and new health hazards. Recently, AIDS threatens further health gains—especially in sub-Saharan Africa where 10 million children may be orphaned by the disease by 2000.

To bring health to all—or at least, most—of the world, nations and international groups face a daunting, but not impossible task. Good health can be achieved at low cost—as China and Sri Lanka have shown—but it requires strong political and social commitment, especially to improve women's education and ensure equal access to health care.

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POPULATION BULLETIN
Vol. 46, No. 4
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The Challenge of World Health

by W. Henry Mosley and Peter Cowley

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The 20th century has seen unprecedented gains in human health and survival. On a global scale, the average life expectancy for a newborn baby doubled from about 30 years in 1900 to 64 years in the late 1980s. For a country like China, this has meant advancing from conditions at the turn of the century, when scarcely 60 percent of newborns reached their fifth birthday, to the present, when more than 60 percent can expect to pass their 70th year.

Advances in science and technology in the 20th century, particularly since World War II, have reached the point where entire populations can approach what appears to be an upper limit in average life expectancy. In Japan, where life expectancy is 79 years, a newborn has only a 4 in 1,000 risk of dying before its first birthday and less than a 1 in 1,000 risk of dying at any age between 1 and 40.

Tragically, social development around the world has not kept pace with advances in the biomedical sciences. More than 300 million people live in two dozen nations where average life expectancy is less than 50 years; in these countries over 100 of every 1,000 newborns die before age one.[1] Reducing these gross disparities in life expectancy—which can occur within prosperous countries as well as across countries—is the health challenge of the 1990s. The constraints to achieving this goal are fundamentally social and political. The scientific base is largely in place and ample evidence from around the world suggests that a great deal of good health can be provided at low cost. China and Sri Lanka are good illustrations: Each has achieved a life expectancy of 70 years with an annual per capita income of less than US$450.

The health picture in the world today reflects the dynamics of political, economic, social, and population change in recent decades. Health in the future will be determined by the choices governments make. Vast improvements in human welfare are possible, but if disparities are allowed to persist, a large fraction of the world's population may never enjoy the level of health already within reach.

Population Dynamics and Health

To assess a population's health situation, mortality levels must be examined within the context of the population's age structure—the proportion of the population in each age group (see Table 1). Under the high-mortality conditions typical of many less developed countries, populations usually have high birth rates and a young age structure (a high proportion of children, adolescents and youth, and a low median age). In these settings, about half of all deaths occur to children under age five, largely caused by infectious diseases, while fewer than 5 percent of deaths are among the elderly over age 75. In contrast, in the low-fertility, low-mortality developed countries with an older age structure, fewer than 2 percent of deaths are among children under age five, and almost two-thirds are among the elderly over age 75.

These contrasting health patterns have many consequences. In high-mortality African villages, for example, deaths among infants and young children occur 10 times more frequently than among the aged. In these circumstances, societies may deal with the frequent deaths of their children by placing a high cultural value on large families, forming only loose emotional attachments to children, and showing great veneration for the elderly. Parents may postpone naming newborns for several months until survival is more certain, and a mother may fail to recall all the deaths of her offspring when asked in surveys. At the same time, families may make substantial investments in funeral arrangements for the few relatives who die at an advanced age.

In the low-fertility, low-mortality settings typical of most industrialized countries, infant and child deaths are so rare relative to adult deaths that they have become socially unacceptable. A family's grief for the loss of an infant may far exceed that for an aged relative. Since child survival is the norm, parents tend to invest much more in each child emotionally as well as financially, and the desire for large families declines.

The demands on the health system will differ under these two circumstances. In industrialized countries, death is often the terminal event after a long series of increasingly debilitating chronic diseases. Providing extended periods of sickness care for an increasingly disabled aging population drives the medical system. In developing countries, maternity and infant care, particularly treatment for infectious and parasitic diseases, is in demand. Since infections respond rapidly to treatment, the need for long-term hospitalization is limited. It must be recognized, however, that the largest age group in these populations is adults ages 15 to 64 (see Table 1) and that in most developing countries this group, particularly the men, may consume the bulk of the limited medical care available in hospitals and health centers.

The demographic transition—the historical shift of birth and death rates from high to low levels—also has profound implications for a country's health system. In the Third World, mortality declines usually have preceded the decline in fertility, as advances in the

Table 1

Population in Developed and Developing Countries, 1960-2020

	Population in millions			Percent distribution			Percent growth	
Age group	1960	1990	2020	1960	1990	2020	1960-1990	1990-2020
Developed countries								
0-14	270	258	244	29	21	18	-4	-5
15-64	595	803	864	63	67	64	+35	+8
65+	80	146	234	8	12	18	+83	+60
Total	945	1,207	1,342	100	100	100	+28	+11
Less developed countries								
0-14	847	1,454	1,836	41	36	27	+72	+26
15-64	1,149	2,447	4,441	55	60	66	+113	+81
65+	79	184	472	4	4	7	+133	+157
Total	2,075	4,085	6,749	100	100	100	+97	+65

Source: United Nations, *World Population Prospects 1990* (New York: UN, 1991).

In less developed countries, the fastest growth will be among the elderly who will put rapidly increasing demands on a health system barely meeting current needs.

treatment of infectious diseases improve infant survival. Initially, the population increases rapidly as growing numbers of infants survive. Later, as birth rates begin to fall, the growth of the population in the youngest ages slows. But because of the large group of young people already born, there is built-in momentum for continued growth of the adult and elderly population for many decades to come.

In the future, the demographic transition coupled with projected declines in mortality will dramatically influence the world's health picture.[2] As depicted in Table 1, most of the population growth in developed countries during the next 30 years, both absolute and relative, will be in the oldest age group, which already consumes substantial health-care resources. In less developed countries, the fastest growth also will be among the elderly who will put rapidly increasing demands on a health system barely meeting current needs.[3] To some degree, the slower growth of the population of children and the substantial gains projected in child health may compensate for the elderly's new demands on health services. But this will be more than counterbalanced by the large increase in the numbers of working-age adults requiring more health services.

Health risks are also changing at an unprecedented rate as the world becomes more urbanized. Urban life is already well established in the developed world. Sixty-one percent of developed-country residents lived in urban areas in 1950. This grew to 73 percent by 1990 and is projected to reach 78 percent by 2020. For less developed countries the shift is even more dramatic. Only 19 percent of the Third World population lived in urban areas in 1950. This had almost doubled to 34 percent by 1990 and is projected to reach 54 percent by the year 2020.[4]

With better living conditions, transportation, and markets, some segments of the urban population enjoy better nutrition and declines in the incidence of the infectious diseases of childhood. At the same time, however, urban residents face new health risks including motor vehicle accidents, pollution, increased consumption of tobacco and alcohol, overnutrition, a sedentary lifestyle,[5] and a greater risk of contracting sexually transmitted diseases.

Economic growth is often associated with increasing inequality.[6] The impoverished—a majority in some countries—live mostly in rural villages or urban slums. They often are subject to the health risks of both the underdeveloped and modernizing sectors of society. They live under conditions conducive to the spread of infectious diseases and have the poorest diets. At the same time, they are more subject than wealthier groups to accidents and injuries and often are the targets of commercial advertising encouraging unhealthy behavior such as cigarette smoking.

Indicators of Health Status

The World Health Organization defines health in positive terms as "a state of complete mental, physical, and social well-being." While this concept may appear straightforward, it does not easily lend itself to measurement. Consequently, to describe the levels, trends, and differences in health, demographers measure the deviations from the healthy state as indicated by the levels of mortality (death) and morbidity (disease and disability). Because mortality is an unequivocal indicator of a population's health status, demographers give considerable attention to analyzing patterns of mortality change and developing standard measurement techniques. Death rates are adjusted for differences in age structure, for example, to obtain a more accurate measure of mortality change over time or to compare rates from a very young country, such as Mexico, with an older country such as Denmark. National mortality data are available for every country in the world; it is important, however, to appreciate the limitations of these data, which are severe in countries with the highest level of mortality (see Box 1).

Box 1

Sources and Limitations of Mortality Data

The ideal sources of data on mortality are national vital registration systems in which deaths are recorded by age, sex, and cause, along with other information. Essentially all of the world's industrialized countries are covered by vital registration systems, but in the developing world, these systems are far less complete. Only an estimated 68 percent of deaths are recorded in Latin America, 15 percent in Asia, and less than 1 percent in Africa.[1]

In fact, vital registration systems in Asia are somewhat better than implied by these figures. China and India, which together constitute the bulk of the Asian population, systematically collect death statistics from representative samples of their populations. Since 1964, India has had a national sample registration system to enumerate births and deaths, and more recently, a rural cause-of-death survey based on lay reporting of the cause of death. A sample of these deaths is verified by physicians. China has a national sample registration system that provides mortality data, most of which is medically certified for more than 100 million people.[2]

In the last 15 years, substantial progress has been made in obtaining reliable estimates of infant and child mortality and fertility from many developing countries from the World Fertility Survey Program and its successor, the Demographic and Health Survey (DHS) project. These surveys obtained a detailed birth and child-death history from a national sample of women of reproductive age. Since 1980, the DHS program has covered approximately 30 countries in Africa, Asia and Latin America, and has provided high-quality information on recent trends and factors influencing infant and child mortality.

In countries without vital registration systems, mortality estimates may be derived from information from censuses and surveys. But the accuracy varies widely depending on the survey design, the questions asked, and who asks and who responds to the questions. Demographers have developed analytical techniques to estimate levels and trends of mortality from census and survey data.

Because censuses and surveys are infrequent, there are many gaps in the knowledge about mortality in the developing world. Nevertheless, international agencies such as the UN Population Division and the World Bank publish current estimates of the population and vital rates for nearly every country in the world.[3] This is done by using all information available, making assumptions about the rates of change in a country's fertility and mortality, and using published model life tables. These estimates and projections are revised as new information becomes available. Because the estimates rest on assumptions based on incomplete data and statistical models, it is no surprise that the UN and World Bank may publish different estimates of the population size and vital rates for the same country.

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Mortality measures by no means give a full or adequate picture of a population's health. Equally important are indicators of morbidity, measured by the incidence or prevalence of specific diseases and disabilities. In the past, when most countries experienced high mortality and illnesses rapidly progressed to death, cause-specific mortality rates provided a good picture of a population's health. Presently in low-mortality industrialized countries, medical interventions postpone deaths. As more people are kept alive with sophisticated treatments, the prevalence of chronic diseases and disabilities in surviving populations will increase. Failure to take this trend into account gives an incomplete picture of health conditions. This is particularly important in developed countries where the greatest future health gains will come from reducing the incidence or delaying the onset of chronic diseases rather than extending life expectancy.[7]

World life expectancy rose from 47.5 years to 63.9 years from the early 1950s to the late 1980s.

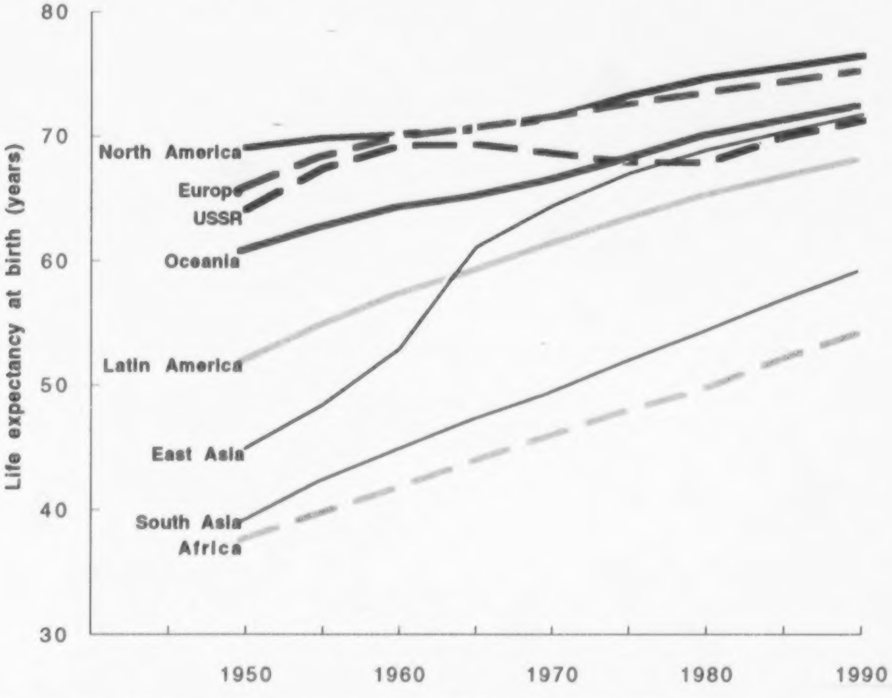
National sample surveys are necessary to measure the prevalence of chronic health conditions (for example, diabetes), precursors to ill health (for example, high blood pressure), health-related behaviors (for example, smoking), disabilities, health-care practices, and health expenditures. Even less information is available on levels, trends, and patterns of morbidity and disability around the world because such data are obtained infrequently and there are problems in developing standard, internationally comparable measures.[8]

Gains in Life Expectancy

In the past four decades, the world's population has experienced a remarkable gain in life expectancy. The United Nations estimates that world life expectancy rose from 47.5 years to 63.9 years from the early 1950s to the late 1980s. This represents an addition of almost one-half year to life expectancy in each year over that 35-year period.

While every region of the world experienced an improvement in survival, the gains were not shared equally, as shown in Figure 1. In the

Figure 1
Life Expectancy in Major World Regions, 1950-1990



Source: United Nations, *World Population Prospects 1990* (New York: UN, 1991).

early 1950s there was a wide gap between the life expectancies of the more developed nations and the developing nations of Asia, Africa, and Latin America. Over the next 35 years, this gap diminished, but mortality decline followed distinct patterns in many of these regions.

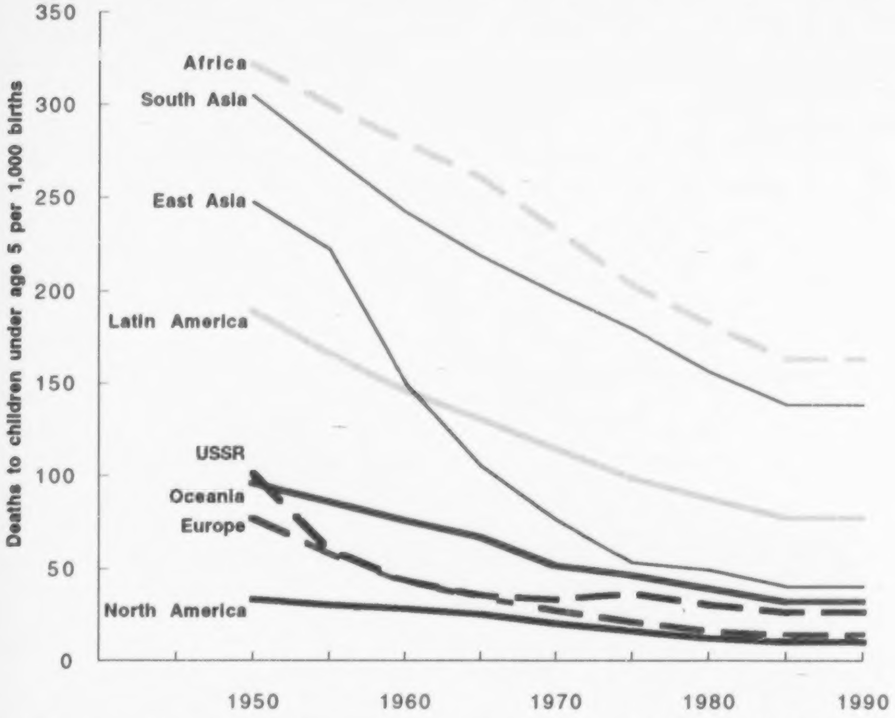
Among the more developed nations, the Soviet Union, after an early gain, actually experienced a decline in life expectancy through the 1970s, which reversed itself only in the late 1980s. Health gains in Eastern Europe also stagnated in this period. In Western Europe and Northern America (the United States and Canada), gains in life expectancy were modest during the first half of this period but have accelerated during the 1980s, primarily because of improved survival among adults and the aged. The greatest gain among industrialized countries was in Japan (included in Eastern Asia in Figure 1), which rose from the lowest (64 years) to the highest (78 years) life expectancy among developed countries over this time.

The developing world experienced divergent trends in life expectancy. Eastern Asia (dominated by China) gained a remarkable 26 years in life expectancy over this time, surpassing Latin America in the late 1960s and even the Soviet Union by the early 1980s. Among the regions of the world with the lowest levels of life expectancy in the 1950s, Africa had shown the least improvement by the end of the 1980s, gaining only 14 years, while Southern Asia gained almost 18 years. Southeastern and Western Asia (not shown in Figure 1) enjoyed even greater gains over the period, enlarging the mortality gaps between Asia and Africa.

Glaring disparities in the life expectancies among individual countries still remain. In the early 1950s, the extremes in life expectancy ranged from a low of 30 years in Sierra Leone, Angola, and The Gambia to a high of 72 years in Iceland, Norway, and The Netherlands—a gap of 42 years. In the late 1980s, life expectancies ranged from 41 years for Sierra Leone and Guinea-Bissau to 78 years for Japan—a gap of 37 years. It should be noted that low life expectancies in developing countries are in part due to high infant mortality

Figure 2

Mortality of Children under Age Five in Major World Regions, 1950-1990



Source: United Nations, *Mortality of Children Under Age 5: World Estimates and Projections, 1950-2025* (New York: UN, 1988).

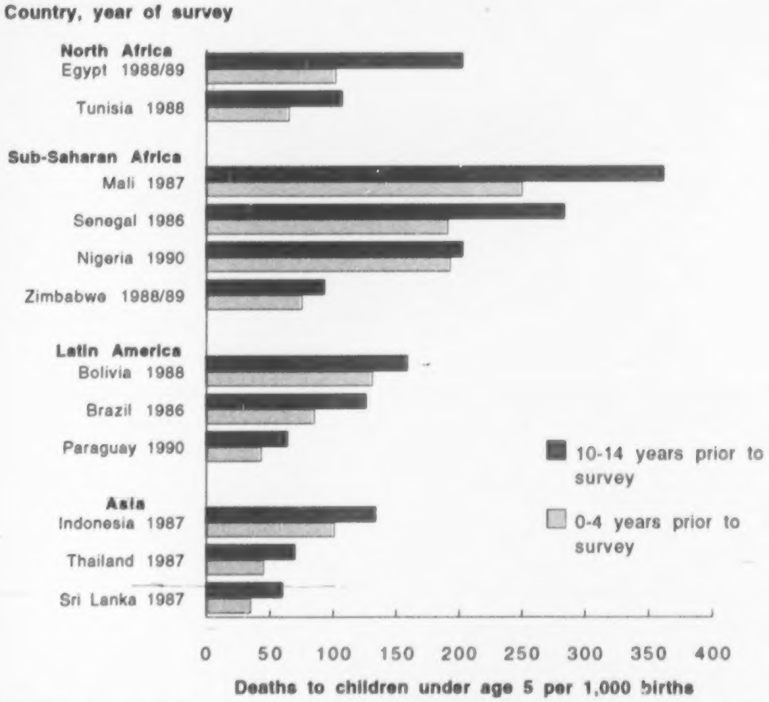
rates. For example, in Sierra Leone, about 25 percent of children die before age five, compared with fewer than 2 percent of children in Japan.

The Health of Infants and Children

From a global perspective, infant and child mortality is overwhelmingly a problem of the developing countries in Africa, Asia, and Latin America. While these countries contain 77 percent of the world's population, in 1990 they accounted for 88 percent of the world's births and 98 percent of the world's deaths among children under age five. Based on the mortality levels for children under age five in highly developed countries, UNICEF estimates that 95 percent of the estimated 14.5 million infant and child deaths in developing countries in 1990 were preventable.[9] While only about 300,000 children under age five died in industrialized countries in 1990 (the majority in Eastern Europe and the former Soviet Union), more than 60 percent of these deaths were potentially preventable.

Figure 3

Improvements in Mortality of Children under Age Five, Selected Countries, 1970s and 1980s



Source: Jeremiah M. Sullivan, "The Pace of Decline in Under-Five Mortality: Evidence from the DHS Surveys" (Paper presented at the Demographic and Health Surveys World Conference, Washington, DC, 5-7 August 1991).

Worldwide, substantial progress has been made over the past four decades in improving child survival. In some regions the improvement has been dramatic. In 1950, an estimated 24 percent of the world's newborns died before reaching their fifth birthday. By 1990, the infant and childhood mortality rate (ICMR) had declined to 10.5 percent, a drop of more than 55 percent. Every region of the world shared in this improvement, with a few deviations, as shown in Figure 2, page 7. The most striking deviation was in East Asia where the ICMR in China declined from 26.6 percent to 4.1 percent, an impressive 85 percent reduction. The greatest relative reduction among the industrialized countries also occurred in East Asia; over this period, the ICMR in Japan declined from 7.5 percent to 0.8 percent, an 89 percent drop. The other remarkable deviation from the trend was the Soviet Union which, through the 1970s, experienced a rising ICMR that resumed a decline in the 1980s.

By 1990, the world regions occupied the same relative ranking by ICMR that they had in 1950—with the exception of East Asia, which dropped well below the world average over the period. The ICMR ranged from 1.1 percent in Northern America to 16.3 percent in Africa in 1990. Among individual countries it ranged from 0.7 in Iceland and Finland to 31.8 percent in Afghanistan and 29.1 percent in Mali.

The Mother's Role in Family Health in Developing Countries

One way to understand the large differences in child survival across countries is to look at the family, particularly mothers, as the primary "producers" of health. The survival of infants and young children is critically dependent upon the nurturing provided by their mothers both during pregnancy (see Box 2) and childhood.[10] In the past few years, the Demographic and Health Surveys (DHS) project has enlarged our understanding of the

Box 2

Low Birth-Weight Babies

When an expectant mother suffers from illness or malnutrition during pregnancy, her baby is more likely to be born underweight, putting it at risk of serious health consequences. In 1985, among an estimated 18 million births in developed countries, 1.2 million (7 percent) had low birth weight—a birth weight under 2500 grams or 5.5 pounds.[1] In developing countries, it is estimated that among 111 million births, almost 19 million (17 percent) were low birth weight. Thirteen million of these occurred in South Asia, representing 25 percent of all births. The frequency of low birth weight was 13 percent in Africa and 10 percent in Latin America.

Most low-weight births in the developing world occur among infants born after a normal period of gestation who suffer from intrauterine growth retardation (IUGR).[2] One of the major causes of IUGR is maternal malnutrition during pregnancy, often coupled with excessively heavy work, particularly during the third trimester of pregnancy. Other important causes of low birth weight are malaria infection and severe anemia related to iron deficiency, frequently aggravated by hookworm infestation. The World Health Organization estimates that 60 percent of pregnant women in developing regions suffer from anemia as compared with only 14 percent in developed regions. Short maternal stature is also a strong predictor of low birth weight.

Studies worldwide have confirmed the importance of low birth weight as a cause of infant and child mortality.[3] In Brazil, low birth-weight babies experience a death rate six times higher than normal-weight babies.[4] Longitudinal studies in Guatemala demonstrated that the higher risk of death among low birth-weight infants persisted through the first four years of life.[5] These same investigations, as well as research in other countries, document that providing additional nutrition to the mother during pregnancy will significantly reduce the frequency of low birth weight and improve child survival.

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maternal factors affecting child health and survival in many countries where vital registration data are poor (see Box 1, page 5). DHS projects have been completed in 28 countries since 1986. While these countries do not represent the entire developing world, they include some of the most populous countries in each region.

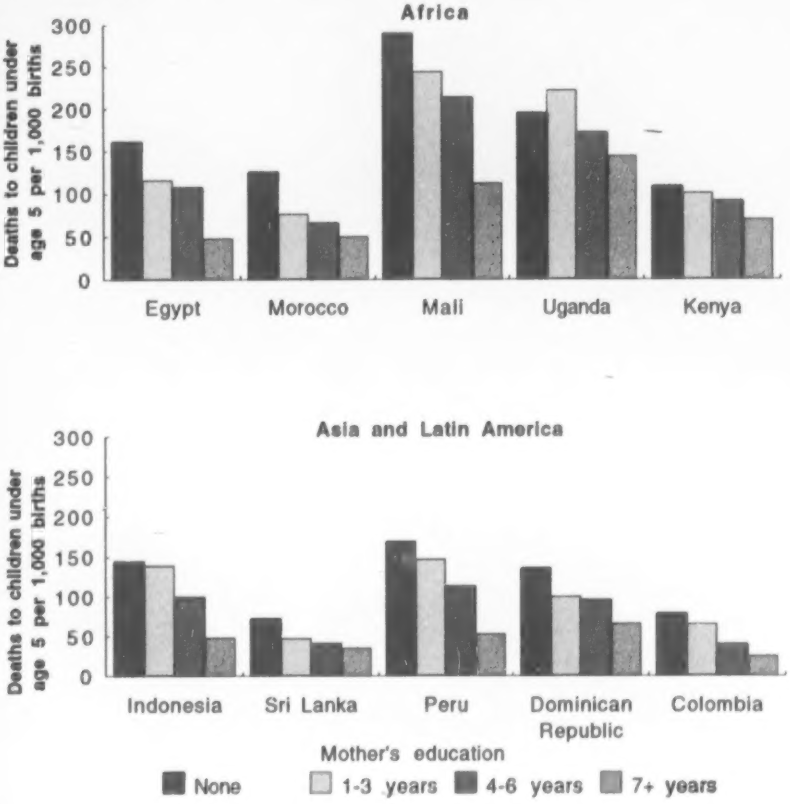
Analysis of the data from these countries reveals some consistent patterns. Over the past decade, mortality rates for children under age five declined in every country surveyed, despite the global recession and economic difficulties many of these countries experienced. By region, the average declines (weighted for the population size of the countries) were: North Africa, 46 percent; Latin America, 32 percent; Asia, 28 percent; and sub-Saharan Africa, 12 percent. Some high-mortality countries experienced large absolute declines. For example, Mali experienced an 11 percentage point decline from 36 to 25 percent. Senegal experienced a decline in mortality under age five of 10 percentage points from 29 to 19 percent (see Figure 3, page 8).

Infant Mortality Risks

Numerous studies have found that infants are at high risk of death if they are born to mothers who are adolescents, over age 40, or have had more than seven births, and when the interval between births is less than two years. DHS data have shown that, compared with children born to women in their 20s, children of teenage mothers were 35 percent more likely to die before age one, while children born to women in their 40s were 47 percent more likely to die. Children who were seventh-born or higher were 50 percent more likely to die by age one compared with second- and third-born children.[11]

Figure 4

Under-five Mortality Rates and Mother's Education, Results from Selected Demographic and Health Surveys, 1986-1990



Source: Shea O. Rutstein, "Levels, Trends and Differentials in Infant and Child Mortality in the Less Developed Countries" (Paper presented at the seminar on Child Survival Interventions: Effectiveness and Efficiency at The Johns Hopkins University School of Hygiene and Public Health, Baltimore, MD, 20-22 June 1991).

The interval between births is the most consistent reproductive factor associated with high infant and child mortality. Children born after short intervals (less than two years) were 80 percent more likely to die than children born after birth intervals of two to three years. Mortality levels among children born after long intervals (four or more years) were 19 percent lower on average than those among children born after two- to three-year intervals.

These findings suggest that family planning programs, coupled with national policies to discourage early marriage and childbearing, can substantially reduce infant and child mortality by preventing births to high-risk mothers.[12] The magnitude of the reduction will, of course, depend upon the proportion of births in the population associated with these risk factors. Various studies have estimated that family planning programs could directly reduce infant deaths by 10 to 30 percent.[13] Less tangible, but likely more powerful, are the indirect effects of family planning programs on maternal and child health.[14] When a woman gains control of her reproduction, she has more time and energy to recover her own health and to give more attention to the care of the children she already has.

Maternal Education and Child Survival

In almost every country where it has been studied, children's chances of surviving improve as their mothers' education increases.[15] The DHS project found striking differences in mortality among children of women with differing levels of education (see Figure 4). Although variations exist between world regions, as little as three years of education is associated with 20 to 30 percent declines in the mortality of children under age five. Of course, education levels are related to living standards—a more educated mother is more likely to have a higher income and live in better housing. Still, when statistical techniques are used to control for these differences, the role education plays in improving child survival is reduced by only one-half.

Maternal education appears to affect child health in a number of ways. Educated mothers often have been introduced to good diets and hygiene in school or by their own educated parents. A more educated mother also may have enough status and power in her family to take appropriate action when her child needs health care. The more educated a mother is, the more likely she is to use maternal and child health services—specifically prenatal care, delivery care, childhood immunizations, and oral rehydration therapy for diarrhea.[16]

This strong and consistent link between maternal education and child survival has important implications for health policy. First, it highlights the large social inequalities in survival that exist not only between but also within countries, even prosperous countries. More importantly, it reveals that even in poor countries, some families can produce a level of child survival that approaches that seen in much wealthier countries. The challenge is to extend these health gains to all people in these countries. The child-survival strategy discussed below was designed to meet this challenge.

Child-Survival Programs in the Developing World

A few major diseases cause most of the deaths among children under age five in developing countries (see Table 2). Recognizing that most of these deaths are preventable at low cost, the international community, led by UNICEF, launched a global campaign in the early 1980s to promote child survival.

The child-survival strategy is designed to reach children and families with a few life-saving technologies and information about personal health care.[17] This highly focused technical approach to public-health problems has a long history beginning with hookworm eradication at the turn of the century and including yellow-fever, malaria, and small-pox campaigns.[18]

Table 2
Causes of Death to Children under Age 5 in Developing Countries

Causes of death	Number (thousands)	Percentage of deaths
Diarrheal diseases	4,000	27.4
Immunizeable diseases	3,700	25.3
Measles	2,000	13.7
Whooping cough	600	4.1
Tuberculosis	300	2.1
Neonatal tetanus	775	5.3
Polio	25[a]	0.2
Acute respiratory infections	2,375	16.3
Malaria	750	5.1
Other infectious/parasitic diseases	450	3.1
Perinatal causes	2,425	16.6
Injuries	200	1.4
Other causes	700	4.8
Total	14,600	100.0

[a] Polio causes about 250,000 paralytic cases annually, of which about 10 percent die.

Source: Alan D. Lopez, "Causes of Death: An Assessment of Global Patterns of Mortality Around 1950," *World Health Statistical Quarterly* 43: 91-104 (1990).

Key elements in the child-survival strategy are immunizations for diphtheria, whooping cough, and tetanus (DPT vaccine), measles, polio, tuberculosis (BCG), and maternal tetanus toxoid to prevent neonatal tetanus; oral rehydration therapy to combat dehydrating diarrheal diseases; vitamin A supplementation and nutrition programs; breastfeeding promotion; birth spacing; and malaria prevention and treatment (see Box 3, page 12). The achievements of these programs in the past decade have been truly remarkable.

Immunization

In 1980, scarcely 15 percent of the children in the developing world were immunized. UNICEF's goal was to vaccinate 80 percent of the world's children by 1990. In 1989, the status in terms of percentage of children reached was BCG (for tuberculosis), 85 percent; DPT (3 doses), 75 percent; Polio, 78 percent; and Measles, 71 percent.

Only in the case of maternal immunization with tetanus toxoid has perfor-

Although malaria is not primarily a childhood disease, more than three-quarters of an estimated 1 to 2 million malaria deaths occur annually in children under age five.

Box 3

Combating Malaria

Over 40 percent of the world's population lives in countries infested with mosquitos that transmit malaria. An estimated 250 to 300 million people carry the malaria parasite in their blood, about 100 million of whom manifest the fever, extreme fatigue, or other signs of the disease. Although malaria is not primarily a childhood disease, more than three-quarters of an estimated 1 to 2 million malaria deaths occur annually in children under age five.[1]

Malaria-carrying mosquitos are found in about 100 countries throughout the world, but almost 90 percent of the malaria infections, cases, and deaths occur in sub-Saharan Africa. Malaria is the leading cause of death among children in countries like Malawi and Ghana where it accounts for 25 to 30 percent of all mortality.[2]

Early attempts at global malaria eradication in the 1950s and 1960s focused on eliminating the mosquitos that carry the disease to humans. These efforts failed because the mosquitos built up a resistance to the insecticide used against them. Presently, the key life-saving intervention in children—early diagnosis and treatment with the drug chloroquine—is being threatened because the most dangerous strain of the parasite is becoming resistant to the drug.[3] Chloroquine resistance, which was first detected in Southeast Asia more than 30 years ago, reached East Africa in the late 1970s and now is reported throughout sub-Saharan Africa.

For the future, malaria control will demand a mix of strategies requiring community participation. This may involve eliminating mosquito-breeding areas by draining swamps, selective use of insecticides, training health workers in the proper treatment of malaria, and promoting household measures. Encouraging reports from The Gambia indicate that insecticide-impregnated netting placed over infant beds may reduce infant and child mortality by up to 40 percent in malaria-endemic communities. In the meantime, research is continuing on a malaria vaccine and improved drug treatment.

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mance been far below the mark, with 44 percent coverage by 1989.[19]

Immunization coverage varies widely in the developing world, reaching 95 percent in China, 76 to 80 percent in the rest of Asia, Latin America, and the Near East, but only 53 percent in sub-Saharan Africa.[20] The accomplishments in some areas of the world have been dramatic during the past five years. China launched a nationwide immunization campaign in the mid-1980s that now has reached 95 percent of the children with all five childhood immunizations. This program extended to even the most remote provinces, which now have immunization levels of at least 85 percent.

The polio eradication program in Latin America, spearheaded by the Pan American Health Organization, has also been remarkable.[21] In 1985, Latin American countries had reached only 66 percent of the population with the polio vaccine and reported 853 cases of paralytic polio. A major eradication program, combining periodic national immunization campaigns with stepped-up, routine immunizations and surveillance activities, increased the coverage to 87 percent by 1990. The incidence of polio declined dramatically to 14 cases in that year.

An estimated one-third of all child deaths in the developing world are caused by pneumonia and other acute lower-respiratory tract infections (ARI).[22] One-quarter of these ARI deaths can be prevented by measles and whooping cough immunizations. Pilot projects in a number of settings around the world have confirmed that more than half the remaining deaths could be prevented by early diagnosis and antibiotic therapy, some of which could be given in the home by community health workers.[23] To date, 36 countries have begun ARI programs based on these community studies. It is too early to assess the large-scale impact of these efforts, but it promises to be substantial.

Oral Rehydration Therapy

The discovery two decades ago that the oral administration of water with sugar and salt could save the lives of children suffering from dehydration due to acute diarrhea has been described as "potentially the most important medical breakthrough this century."[24] Previously, such episodes were treated with intravenous fluids, unavailable or costly in many parts of the world. Oral rehydration therapy (ORT) combats dehydration through either the use of inexpensive packets of oral rehydration salts (ORS) or a home-prepared fluid mixture. Continued feeding, including breastfeeding, during the diarrhea episode is also recommended.

In the past decade, ORT programs have been initiated in more than 100 developing countries and ORS packets are now available to 61 percent of these countries' populations.[25] Some 36 percent of diarrhea episodes are now treated through ORT.

UNICEF estimates that in 1990 more than 1 million diarrhea deaths were prevented by ORT, but an additional 2.5 million preventable diarrhea deaths still occurred. An important reason is that health professionals in many countries (including the United States) have been slow to adopt this innovation. For example, in 1988, a WHO survey of 46 developing countries documented that only 14 percent of physicians, 4 percent of nurses, 8 percent of paramedics, and 9 percent of community health workers had been trained in the ORT management of diarrhea.[26] Some countries, such as Egypt, are making extraordinary progress. Beginning in 1983, 40,000 Egyptian physicians were trained and ORS was made freely available in more than 85 percent of the health centers as well as through a national marketing program. By 1988, 80 percent of mothers knew about the dangers of dehydration from diarrhea and 50 percent had treated their child's most recent episode with ORT. The program accelerated the decline of diarrhea deaths among infants and children over the five-year period.[27]

Breastfeeding Promotion

During the first six months of life, bottlefed infants living in impoverished environments are three to six times more likely to experience diarrhea and respiratory infection as are fully breastfed infants.[28] Death rates and infant malnutrition are correspondingly higher. Maternity services and hospitals have often contributed to the decline of breastfeeding by following the Western

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Breastfeeding helps ensure good nutrition and health for infants.

medical practice of separating babies from mothers at birth. Further, few health workers have been trained in how to support mothers in breastfeeding. The problem in many developing countries has been compounded by commercial enterprises that aggressively promote breastmilk substitutes. In the late 1970s, WHO and UNICEF developed an International Code of Marketing of Breastmilk Substitutes in order to prevent the irresponsible promotion of feeding bottles and powdered baby milk. To date, however, few countries have enacted this code.

Malnutrition, while not listed as a direct cause of death, has been estimated to be a contributing factor in up to 40 percent of child deaths.

Vitamin A Supplementation and Nutrition

Studies in Indonesia, Thailand, and India have shown that administering one vitamin A capsule at intervals of one week to six months (depending on the dose) reduces early child mortality by up to 40 percent in vitamin A-deficient populations.[29] Vitamin A supplementation is now being added to a number of immunization programs as well as being used in clinical settings where it improves survival among children seriously ill with measles. At the same time, programs are encouraging mothers to add green and yellow vegetables rich in vitamin A to their children's diet.

While there is no doubt that the technical interventions described above are having a substantial impact on child survival, the more intractable problem of childhood malnutrition is limiting the net gains. An estimated 177 million children in the developing world are malnourished.[30] The prevalence of malnutrition—manifested by stunted growth and/or body wasting (severe weight loss)—ranges from highs of 42 to 47 percent in South and Southeast Asia to 26 percent in Africa, 21 percent in China, and 14 percent in Latin America.

Malnutrition, while not listed as a direct cause of death, has been estimated to be a contributing factor in up to 40 percent of child deaths. The causes of malnutrition are complex—related to a host of factors from food availability and food prices at the national level, to inadequate family income, inappropriate family feeding and dietary practices, and recurrent infections and parasitic infestations. As implied by the interrelated web of causes, social and economic interventions to promote adequate nutrition must operate at every level in the society, from national food policy to the selection, preparation, and equitable distribution of a household's food among family members.

Infant and Child Mortality in the Developed World

Preventable infant and child deaths are not restricted to developing countries; they occur in the developed world as well, particularly among minority and disadvantaged populations. In the United States, for example, there are glaring disparities in the childhood mortality of white and black populations. In 1988, the infant mortality among blacks (17.6 per 1,000) was double the level among whites (8.5 per 1,000).[31] Washington, D.C., with a majority black population, had an infant mortality rate of 21.2 per 1,000, higher than in less developed countries such as Cuba, Costa Rica, and Chile.

Social disadvantage explains most of these mortality differences.[32] In 1989, black newborns were more likely than white to have a mother with less than 12 years of education (29 compared with 21 percent). Correspondingly, black mothers were less likely to have received prenatal care in the crucial first trimester of pregnancy (60 percent versus 79 percent). Black infants were more than twice as likely to have mothers under age 18 (10 percent versus 4 percent) or to be low birth weight (13 percent versus 6 percent).

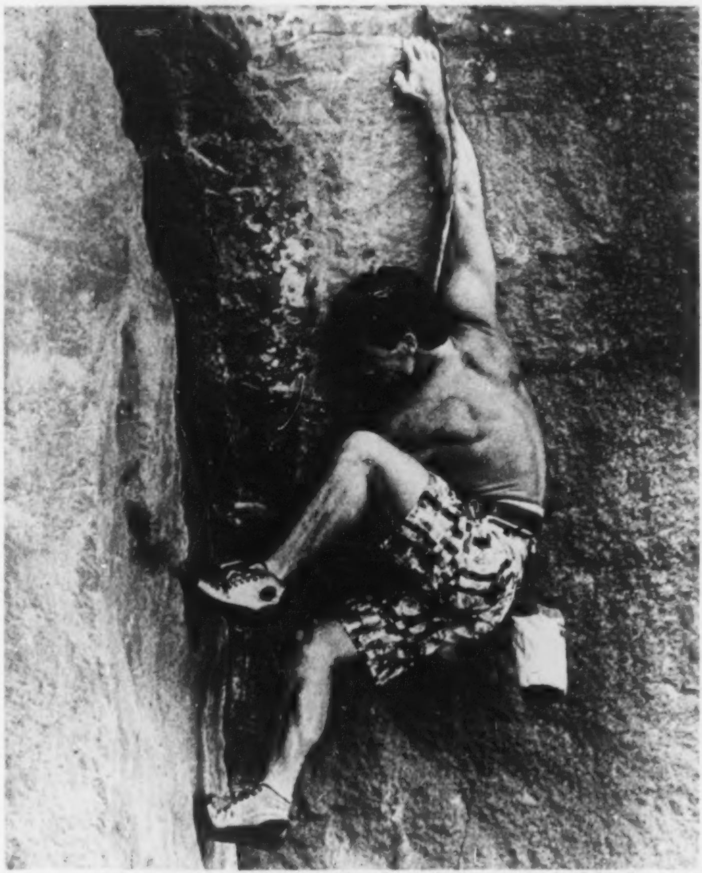
Many of these risks could be reduced by government policies to provide information and services to disadvantaged groups. For example, the teenage pregnancy rate in the United States is 10 times higher than in most European countries. In Europe, young people have greater access to sex education and contraceptive information and services. The U.S. government does have programs to address the nutritional and health needs of disadvantaged groups such as the Special Supplemental Food Program for Women, Infants, and Children (WIC). WIC has proven cost-effective in preventing low birth weight and reducing infant and child mortality.[33] In recent years, however, WIC funding has not been sufficient to keep pace with the growing numbers of eligible women and children.

Health in Childhood

As a child grows older and the immune system matures, the risk of death from acute infectious diseases declines substantially: age-specific death rates typically reach their lowest levels between the ages of 5 and 14. Still, an estimated 1.7 million children in this age group die each year worldwide, 97 percent in developing countries. More than 98 percent of these deaths are preventable.

In the poorer developing countries, acute infectious diseases such as pneumonia, meningitis, and rheumatic fever continue to a take a toll among children. Typically, childhood is when the heaviest loads of intestinal parasites are acquired.[34] In areas with poor sanitation, the prevalence of *Ascaris* (roundworm) and hookworm can reach 80 to 90 percent in older children and young adults. Where the intermediate snail host exists, schistosomiasis (bilharzia) can reach the same levels. These intestinal worms do not multiply in humans; rather, repeated exposure to the eggs or larvae in soil and water contaminated by feces leaves people with high levels of worm infestation. Worms can produce acute intestinal problems, severe anemia, general debility and—with schistosomiasis—chronic liver damage in adults.

Drugs can be used for mass therapy. One dose a year in schools or communities is a cost-effective means of reducing the burden of these worms and slowing transmission to others. In the long run, measures to reduce fecal contamination of the environment will be needed to interrupt transmission.


Kenneth C. Poertner

Young adulthood often means risk-taking behavior—and higher rates of injury and accidental death.

In the developed world, unintentional injuries have replaced infectious diseases as the greatest health concern in children. For example, in the United States nearly half of all childhood deaths are due to injuries; about half of these stem from motor vehicle crashes. Recognizing this, all 50 states now require safety restraints for young children—contributing to declines in motor vehicle injury deaths. Since 1970, the rate of deaths from motor vehicle crashes has declined 41 percent for children ages 1 to 4, and 31 percent for those ages 5 through 14.

Youth and Young Adulthood: The Critical Transition

Adolescence and youth is a formative period when many life-long behaviors are adopted. Behavior patterns young people develop affect their health in two ways: in the short term, by the injuries and violence that kill and disable many as they pass through this period and, in the long term, as they adopt lifestyles that will profoundly affect their health many years later. Particularly relevant to health are smoking (see Box 4), and alcohol and substance abuse.

In the United States, the three leading causes of death among young persons ages 15 to 24 are accidental injuries (primarily from motor vehicle accidents), homicide, and suicide. In sharp contrast to deaths from infections, the deaths from these more social causes have been rising for decades.

Motor vehicle accidents account for three-quarters of all deaths from

Box 4

Tobacco: A Global Health Problem

Worldwide, about half the adult males and 10 percent of adult females smoke, and the rate is increasing at 2 percent per year, largely in developing countries.[1] The health consequences of tobacco addiction are staggering. Each year in the United States cigarette smoking causes more deaths than all of the following combined: alcohol, cocaine, heroin, homicide, suicide, automobile accidents, and AIDS. Overall, 20 percent (434,000) of the 2.17 million deaths in the United States in 1988 were attributed to smoking.[2]

Tobacco's annual mortality toll is estimated at 2.5 million deaths, a figure projected by the World Health Organization to rise five-fold over the next 50 years, primarily in the developing world. Rates for chronic diseases associated with smoking are at least ten times greater.

Smoking should be considered the most serious health problem among young people worldwide even though the cancers, cardiovascular and other diseases related to tobacco consumption are not manifest for an average of two decades. Tobacco promotion is heavily targeted to young people. Recent U.S. surveys show that 85 percent of adults addicted to tobacco started smoking regularly before age 20.[3] Studies from other developed countries show that smoking patterns are already well established by ages 20 to 24.

In the United States, the prevalence of smoking has been declining since the Surgeon General's Report on "Smoking and Health" in 1964. The decline resulted from the concerted effort of local, state, and federal authorities, health professionals, and citizens guided by thousands of articles on the adverse health effects of smoking. In 1965, 53 percent of white men and 38 percent of white women ages 18 to 24 smoked. But, cigarette smoking declined much more rapidly among U.S. males, narrowing the difference by gender. By 1987, just under 30 percent of young white men and women smoked.

Public-health measures to control smoking in the United States after 1965 began with warning labels on cigarette packages. These warnings were strengthened in the ensuing years, followed by requiring the labeling of tar and nicotine levels and, in 1971, a ban on radio and television advertising of cigarettes. In recent years, bans on smoking in public places have increased.

In the past two decades, most Western industrialized countries have adopted measures to discourage smoking, resulting in 10 to 30 percent declines in cigarette consumption. Yet in Eastern Europe and the former Soviet Union, where smoking has not been discouraged, cigarette consumption increased 20 to 30 percent in recent decades.[4]

A few developing countries, like India, have passed laws to reduce tobacco consumption. Nigeria has banned smoking anywhere in public, including outdoors. Most countries have not yet taken steps to discourage smoking. China is a case-in-point. China, which produces nearly 50 percent of the world's tobacco and nearly one-quarter of the world's cigarettes, has had an open door to foreign tobacco corporations. The China-American Cigarette Company, a joint venture, opened in 1988 with a production capacity of 2.5 billion cigarettes per year. The foreign companies are also exporting western advertising strategies to China.[5]

More than 250 million people in China smoke, most commonly men. Half of the global increase in tobacco use from 1976 to 1986 occurred in China. As in the West, most Chinese smokers report having begun smoking between the ages of 15 and 24. Based on the current smoking levels in China, an avalanche of smoking-related deaths over the next several decades is predicted.[6] Of the Chinese children alive today, an estimated 50 million will eventually die from tobacco-related diseases given current trends.

Japan, Taiwan, and South Korea are the other Asian countries where transnational tobacco companies aggressively market their products. The U.S. government has threatened trade sanctions unless U.S. tobacco products were accepted and cigarette advertising permitted. The advertising is primarily aimed at youths, resulting, for example, in a sharp increase in smoking among adolescents in Taiwan.

In 1989, an international coalition of health and consumer groups was able to persuade the U.S. government to abandon efforts to get Thailand to remove controls on U.S. tobacco imports. Former U.S. Surgeon General C. Everett Koop commented on these events on national television: "It is reprehensible for industrial nations to export disease, death, and disability in the way of cigarette smoke to developing countries, putting on their backs a health burden that they will never be able to pay for 20 to 30 years from now."

Half of the global increase in tobacco use from 1976 to 1986 occurred in China.

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unintentional injuries in the 15- to 24-year age group. More than half of all fatal crashes involve alcohol use.

Homicide is the number one cause of death among black youths. The homicide rates among black males ages 15 to 24 are almost 10 times higher than among white males—11.5 deaths per 1,000 population among white males in 1988, compared with 101.8 deaths per 1,000 among black males. Socioeconomic factors explain much of this racial difference. Homicide rates increased substantially between 1950 and 1988, growing from 3.7 to 11.5 per 1,000 for whites and from 58.9 to 101.8 per 1,000 for blacks. Proportionally the increase was greater among white youth. This means that the actual increase in the number of deaths was about the same among white youth and black youth, because there are more than five times as many whites as blacks in the United States.

About half of all homicides are associated with alcohol use and about 10 percent are related to drug use.[35] More than half of all homicide victims are relatives or acquaintances of their killers, and most are killed with firearms. The United States—which has few restrictions on the sale of handguns and other firearms—has the highest firearm mortality rate of any developed country in the world.

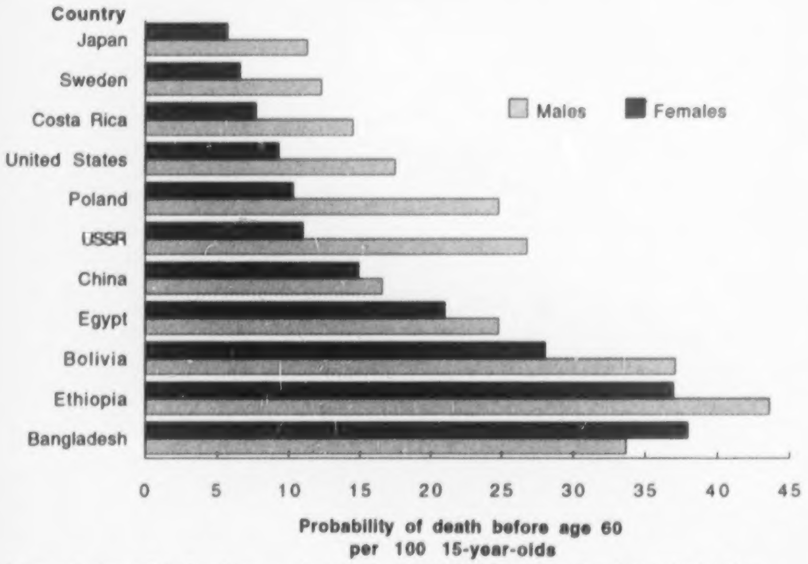
Injuries in the Developing World

Accidents, injuries, and poisoning account for an estimated 6 percent of deaths in developing countries.[36] This is about the same proportion as in developed countries (7 percent). But, disability from injuries is substantially higher in developing countries.

The trend in injuries in developing countries is difficult to ascertain because of lack of data. One thing is certain: Because deaths from infectious and parasitic diseases have fallen, injury has emerged as the most important cause of death among children and adults up to age 40. Also, some of the trappings of modernization—such as increased traffic and rapid, often unregulated construction—introduce new hazards to burgeoning urban populations. As an example, in Taiwan, unintentional injuries rose from the seventh to the third leading cause of death between 1960 and 1977. The injury mortality rate increased almost 50 percent in this time. In Saudi Arabia, the dramatic increase in the number of roads and vehicles over a period of two decades has been associated with a nearly 600 percent increase in morbidity and mortality due to motor vehicle crashes. In other situations, modernization introduces safer methods or techniques and can reduce injuries. For example, in Nigeria, mechanization of coal mines was linked to a 60 percent reduction in mining injuries.

Figure 5

Risk of Dying before Age 60 for 15-year old Males and Females from Selected Countries, 1980-1990



Source: Richard G.A. Feachem, et al., eds., *The Health of Adults in the Developing World* (New York, Oxford: Oxford University Press for the World Bank, forthcoming).

Adult Health

Working-age adults—defined here as persons ages 15 to 65—are an important group from a health perspective. Not only do they make up two-thirds of the world's population, but disease and disabilities in this group have a major impact on the welfare of families and the economy.

Perhaps the most important but least-noted health "breakthrough" in recent years has been the growing recognition that many chronic diseases among adults are not the inevitable consequences of aging but are the result of lifestyles and behaviors that can be changed.[37] All the biological mechanisms are not fully understood and for many chronic diseases (for example, cancer and coronary heart disease) multiple risk factors interact in complex ways. Still, informing the public that reducing dietary fat and salt, avoiding obesity, exercising, sleeping and eating regularly, using alcohol moderately and avoiding tobacco, has had a major effect on lifestyles in many developed countries. And the effect of these lifestyle changes can be measured in declines in some of the leading causes of death.[38]

One way to compare health conditions among adults in different countries is to consider what proportion of persons who reach age 15 will survive to age 60. Figure 5 presents these data from selected developed and developing countries that illustrate some of the regional and country variations in adult survival. Japan, with an average life expectancy at birth of 78.3 years sets the world standard. Only 11 percent of males reaching age 15 may expect to die before age 60. The corresponding risk for females is 6 percent. For industrialized countries, such as Sweden and the United States, mortality risks are somewhat greater, ranging from 12 to 18 percent for males and 6 to 9 percent for females.

A different picture emerges in Eastern Europe and the former Soviet Union, particularly for men. While female mortality risks for Eastern Europeans are only about 2 to 4 percentage points higher than their counterparts in the Western industrialized countries, male mortality risks run 10 percentage points higher.

Among the developing countries, there is greater variability. Sub-Saharan Africa lies at one extreme. In many countries more than 30 percent of the females and 40 percent of the men of working age will die before age 60. These figures do not take into account the emerging AIDS epidemic, projected to substantially increase death rates in this age group, particularly in sub-Saharan Africa (see Box 5, page 20). In South and Southeast Asia, the percentage of 15-year-olds expected to die before reaching age 60 ranges from the upper 20s to the low 30s. The risks are somewhat lower in the Middle East and lower overall in Latin America, with some variation. At the extremes are Bolivia, where 37 percent of the males and 28 percent of the females age 15 are projected to die before age 60, and Costa Rica, where only 15 percent of the males and 8 percent of the females will die prematurely.

The remarkable improvements in survival in China are reflected by a male mortality risk of 17 percent, equivalent to the levels in Western Europe; however, females in China have not gained as much. At 15 percent, their mortality risk is almost double that of their European counterparts, reflecting the lower status of women in Chinese culture. Chinese females have poorer diets, receive less health care, and have fewer educational and occupational opportunities than do Chinese males.

Adult Health in Developed Countries

Many people assume that once a country reaches a high level of development, overall health conditions will steadily improve or at least remain stable, barring unforeseen disasters or new epidemics such as AIDS. Over the past three decades, the experience in industrialized countries has been somewhat different.[39]

Throughout the Western world and Japan, adult mortality has declined progressively since 1950 for both sexes, contributing in large measure to the overall gains in life expectancy depicted in Figure 1, page 6. In Eastern Europe and the Soviet Union, health conditions stagnated in the 1970s with only slight gains emerging in the late 1980s. In the Soviet Union there was actually a four-year loss in life expectancy (from 66.1 to 62.3 years) between the mid-1960s and the early 1980s.

The distinct feature of this decay in health status in Eastern Europe and the former Soviet Union was that it was heavily concentrated among males, particularly adult men. For the most part, health conditions among women tended to improve modestly or at least not decline significantly. As a result, the gap in life expectancy between males and females in these countries widened dramatically.[40] For example, in the Soviet Union in 1964-65, the life expectancy for men peaked at 66.1 years when female life expectancy was 73.8 years, a gap of 7.7 years. By 1980-81, male life expectancy had declined to 62.3 years while female life expectancy dropped slightly to 72.5 years, increasing the gap to 10.2 years.

The negative health trends among men in Eastern Europe have been attributed to increases in alcohol consumption and smoking, deterioration in diets, growing pollution, and an

continued on page 22

Box 5

Sexually Transmitted Diseases, HIV Infection and AIDS

Until the advent of acquired immunodeficiency syndrome (AIDS) in the 1980s, health programs generally accorded sexually transmitted diseases (STDs) a relatively low priority. This was particularly true in developing countries despite the serious health problems these diseases cause.[1] For example, it has been long recognized that a high prevalence of infertility (ranging from 10 to 30 percent in some areas) in a belt that extends across Central and Eastern Africa is related to high STD rates. Likewise, approximately 80 percent of an estimated 470,000 new cases of cervical cancer each year occur in developing countries.[2]

There are more than 50 STDs. The most commonly reported are gonorrhea, syphilis, and genital herpes, which may produce serious complications including pelvic inflammatory disease, sterility, premature delivery, infections in the newborn, and death. Other STDs include: *Chlamydia Trachomatous,* a leading cause of pelvic infection and sterility in some populations; hepatitis B virus, which causes liver disease and liver cancer; and human papilloma virus, which may be the primary cause of cervical cancer. In the 1990s, AIDS is the most publicized STD.

The first case of AIDS was recognized in the United States in 1981. Because of the several-year lapse between infection with human immunodeficiency virus (HIV) and the onset of the disease, it is now known that HIV was circulating in different countries in the 1970s. During the 1980s, HIV spread rapidly throughout the world. By 1990, 323,000 AIDS cases had been officially reported to the World Health Organization (WHO) from 153 countries. WHO estimates the actual number was closer to 1.2 million with an estimated 5 to 10 million persons infected with HIV. WHO projects that by the year 2000, adult AIDS cases will rise from the present level of under 100,000 per year to over 800,000 per year and that adult HIV infections will reach 13 million worldwide.[3]

HIV is transmitted in three ways: sexual intercourse; exposure to HIV-infected blood, blood products, or donated organs and semen (through transfusions of unscreened blood, or use of unsterilized needles and syringes, for example); and from an infected woman to her fetus or infant. WHO describes three epidemiologic patterns of HIV infection:

Pattern I: The major affected groups are homosexuals or bisexual men and intravenous (IV) drug abusers. This pattern has been typical of Western Europe, North America, parts of South America, Australia and New Zealand.

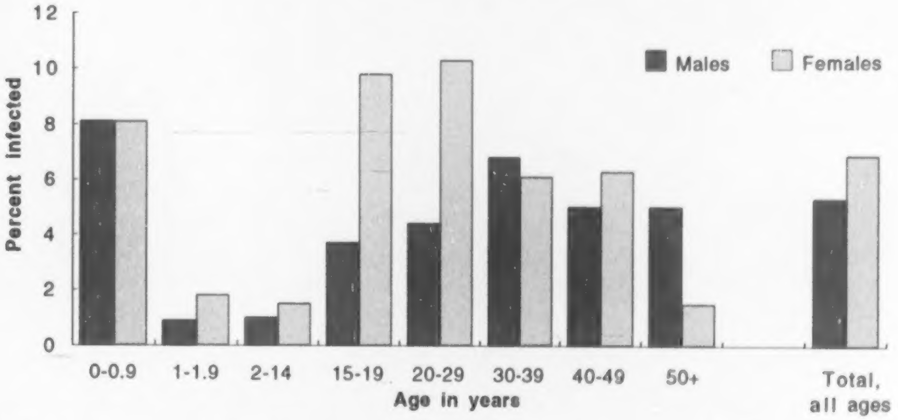
Pattern II: Heterosexuals are the main group affected. This is typical of sub-Saharan Africa, the Caribbean, and parts of South America.

Pattern III: Prostitutes and IV-drug users account for most cases. This pattern is typical of countries where HIV has recently been introduced. Much of Asia, the Middle East, and Eastern Europe fit this pattern.

The AIDS epidemic is particularly severe in sub-Saharan Africa and is projected to have major social and economic consequences.[4] While data are scarce, surveys in a dozen African cities show 5 to 30 percent of adults infected with HIV. The figure above demonstrates an infection pattern typical of heterosexual transmission in Kinshasa, Zaire. Infection rates are high among younger women, older men, and children under age one—infected by their mothers.

Many factors have hastened the spread of STDs and AIDS in sub-Saharan Africa in recent years. Increasing urbanization disrupted traditional social systems that controlled sexual activity, rural

HIV-seroprevalence Kinsasha, Zaire 1984-1985



Source: T.C. Quinn, et al., "AIDS in Africa: An Epidemiologic Paradigm," *Science* 234 (1986): 955-963

poverty compelled people to migrate, the few educational and employment opportunities for females contributed to prostitution, and, in some African countries, a low ratio of women to men in cities produced a high demand for prostitutes.

AIDS is already having a major impact on health systems. In sub-Saharan Africa, over half the admissions to many hospitals are AIDS related. TB cases are rising because of HIV infection.

Given the trends of HIV infection in sub-Saharan Africa, analysts project a doubling or tripling of adult mortality and a 20 percent rise in infant mortality within 25 years. By 2000, an estimated 10 million uninfected children will be orphaned as their parents die from AIDS.[5]

WHO is coordinating a global effort to control the AIDS epidemic. In industrialized countries, blood and blood products are now well protected; and homosexual men are practicing safer sex. Media campaigns communicate the risks of HIV and promote safer sex among the general public. Condom use is being promoted worldwide.

Numerous obstacles block progress on these fronts. Reaching poor populations in developing countries is difficult; so is reaching IV-drug abusers in developed countries and motivating them to change deep-rooted behaviors.

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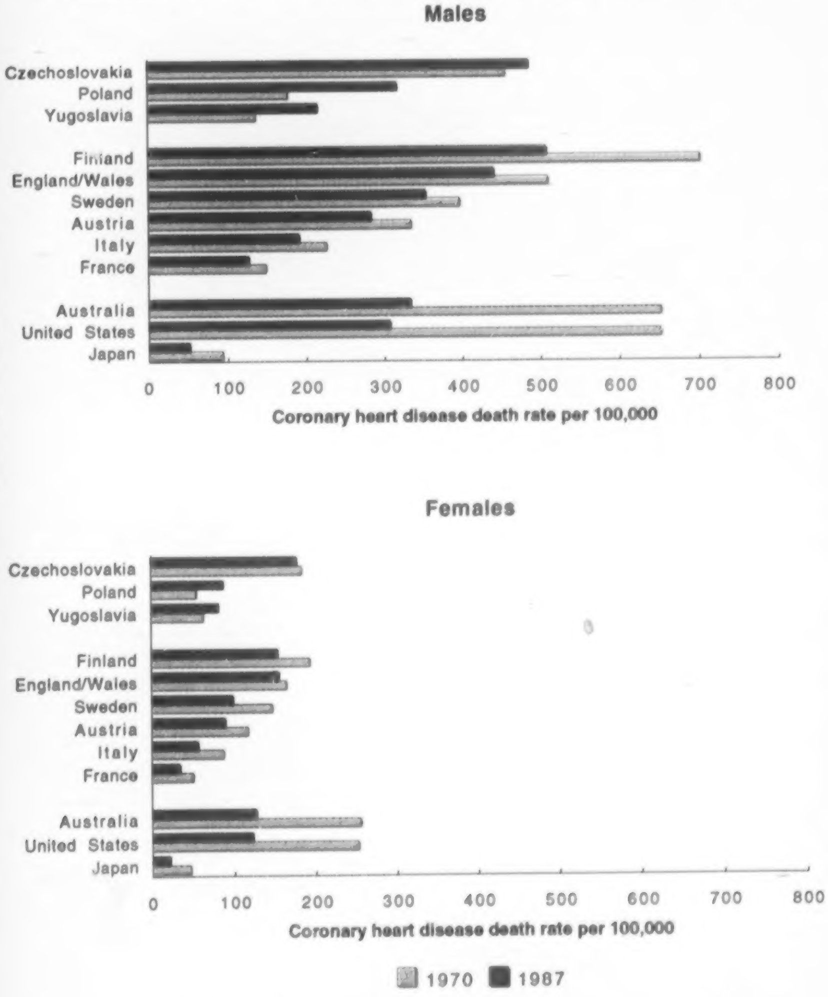
increase in the number of accidents.[41] For example, per capita tobacco consumption increased by 20 to 30 percent in Eastern Europe through the 1970s and into the early 1980s, in marked contrast to the 30 to 40 percent decline seen in Western Europe and the United States due to the institution of tobacco control measures. As a consequence, deaths due to diseases of the heart, and of the respiratory and digestive systems increased in Eastern Europe.

Coronary heart disease (CHD) exhibits the characteristics of a disease strongly linked to lifestyle (see Figure 6). CHD is predominantly a male disease, in part reflecting the heavier tobacco consumption by men in most countries.[42] The CHD mortality rates vary by a factor of 10 across countries, being lowest in Japan and highest in countries such as Finland and England and Wales. The rate is six times higher in the United States than in Japan. Interestingly, Japanese who resided in Hawaii and the continental United States have CHD mortality rates between the low levels of Japanese residents and the high levels of white U.S. residents.[43] These findings suggest that lifestyle plays a larger role in CHD mortality than does ethnic background.

Figure 6

Coronary Heart Disease Death Rates in Developed Countries, Men and Women Ages 35-74, in 1970 and 1987



Source: Based on data from the World Health Organization, *World Health Statistics Annual* (Geneva: WHO, various years).

Deteriorating living standards in Eastern Europe may explain why mortality from CHD has increased for men in the former Soviet Union and all the Eastern European countries, while it has declined sharply in 20 out of 22 Western countries.[44] The United States, Australia, and Finland were among the countries that enjoyed dramatic declines in heart disease deaths over the period, as shown in Figure 6.

By the mid-1980s, the Soviet Union and Eastern European countries had the highest death rates of all industrialized countries for diseases of the circulatory, respiratory, and digestive systems, and injuries.[45] The particularly high male mortality from these causes explains most of the gap between male and female adult mortality. In the mid-1980s, the Soviet Union began taking strong measures to reduce alcohol consumption—with some success.[46] Within the next two years the impact of lower consumption was associated with a 36 percent decline in Soviet mortality from accidents and poisonings (including alcohol).

The United States may be taken as an example of the trends in adult health seen in the Western countries. Beginning in the 1960s, Americans became more health conscious. A precipitating event was the 1964 Surgeon General's Report alerting the American public to the health risks of cigarettes. Within two years, cigarette consumption peaked—after rising for more than six decades—and then began an uninterrupted decline.[47] At the same time, the public was becoming increasingly aware of the scientific

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Americans' pursuit of healthier lifestyles—more excercise, better diets, and less smoking—helped reduce adult mortality.

evidence linking diet and heart disease. This was given added impetus in 1974 when the Canadian Minister of National Health and Welfare issued, "A New Perspective on the Health of Canadians," emphasizing a preventive approach centered on lifestyle and behavior changes.[48]

In 1975, the U.S. Centers for Disease Control convened a group of 40 health professionals to look at the 10 leading causes of death in the United States and assess the relative role various risk factors play in contributing to mortality.[49] The group concluded that lifestyle made up nearly half (49 percent) the mortality risk. Of the remainder, they determined that heredity and biological factors made up 26 percent; environment, 16 percent; and health systems, 11 percent.

All these findings were translated into a major national initiative in 1979 when the U.S. Surgeon General issued "Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention."[50] This document examined the risks to good health in the United States and explicitly defined areas for health improvement grouped under three strategies: preventive health services, health protection, and health promotion. These included behavioral changes related to smoking, alcohol and drug abuse, diet and exercise, and health protection including occupational safety and accident prevention; as well as preventive health services such as immunizations, family planning, and improved management of high blood pressure.

The transformation in the public's behavior has been dramatic, although inadequate among people in the lower income groups. Since 1963, tobacco consumption declined by more than 40 percent; the use of butter, whole milk, and cream declined by 25 to 30 percent, and the use of animal fats and oils dropped by 40 percent. At the same time, vegetable fat and oil use increased by 60 percent and fish consumption by more than 25 percent. In 1987, an estimated 30 million Americans reported they practiced regular aerobic activity.

The health impact of these changes has been substantial. The U.S. death rate (adjusted for changes in age structure) took a sharp downturn in the late 1960s after stagnating for more than a decade. This decline was largely a result of substantial reductions in mortality from chronic diseases among adults. For example, heart disease, the leading cause of death among adults ages 25 to 65 in 1950, declined dramatically.[51] As shown in Figure 6, the death rates for coronary heart disease declined by more than 40 percent between 1970 and 1987 for Americans ages 35 to 74. Stroke death rates dropped by more than 50 percent. As a result, cancer became the leading cause of death in this age group in 1987 followed in order by: heart disease; injuries; stroke; suicide; liver disease; chronic lung disease; homicide, HIV infection (AIDS); and diabetes.

Overall cancer mortality rates have changed very little since 1950 because cancer is really many diseases associated with a variety of risk factors. There have been significant changes for some specific cancers, however. Lung cancer mortality, 85 percent of which is due to smoking, more than tripled since 1950. The encouraging news is that lung cancer has declined among young people, reflecting their lower rates of smoking. Among men, lung cancer mortality began to decline in 1963 for the age group 30-34. As this group aged, rates declined in progressively older age groups. In 1969, rates declined among the 35-39 age group, in 1971 among those ages 40-44, in 1976 among those ages 45-49, and by 1980 small declines were beginning in the 50-54 and 60-64 age groups. For those over 65, however, rates have continued to increase, reflecting a lifetime of heavy tobacco consumption.

The encouraging news is that lung cancer has declined among young people, reflecting their lower rates of smoking.

Among women, lung cancer surpassed breast cancer to become the leading cause of cancer mortality in the late 1980s. Lung cancer has increased among older women because they began smoking later and a smaller proportion have quit. The age-specific mortality decline in lung cancer for women under 45 has just begun since 1979.[52] Breast cancer occurs more than twice as often as lung cancer; however, with early diagnosis, women have a better chance of surviving breast cancer.

The most important exception to this pattern of improving health is the dramatic increase in deaths due to AIDS. The first case in the United States was diagnosed in 1981; by 1990 it had become the 11th leading cause of death for Americans of all ages.

Adult Health in Developing Countries

Compared to the industrialized world, little is known about adult health in developing countries. The lack of knowledge is a serious handicap for international health policymaking given that 75 percent (2.4 billion) of the estimated 3.2 billion persons in the 15-

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China has made remarkable improvements in adult health and survival since the 1950s.

64 age group lived in developing countries in 1990 (see Table 1, page 3). In the next 30 years, the number of persons in this age group will increase at more than three times the rate of the younger population, reaching 4.4 billion by the year 2015. This 81 percent increase contrasts with a projected increase of only 8 percent in this age group in the developed countries over the same time.

Over the past four decades, adult survival in all regions of the developing world has improved steadily, paralleling the overall gain in life expectancy. The most dramatic improvement has been in China; the least improvement in sub-Saharan Africa. At present, the likelihood of death between ages 15 and 60 in developing countries averages about 23 percent. A continuing decline in mortality rates is projected; however, because the populations are growing so rapidly, the number of adult deaths will increase. In 30 years, 50 percent more deaths and correspondingly more illnesses are projected. This demographic fact led the World Bank to conclude in a recent study that "the central adult health problem is the rising absolute number of adults who are sick and dying" in spite of progressively declining death rates.[53]

There is a great diversity of diseases in this age group, the result of a convergence of two separate processes.[54] First, there are infectious diseases. Although these are fading as social and economic conditions improve, adults living today experienced more infectious and parasitic diseases in their childhood 30 to 50 years ago than do children today. Many of these diseases have left residual disabilities (for example, lameness with polio, blindness with trachoma, hearing loss from ear infections) or progressive consequences (for example, rheumatic heart disease, liver cirrhosis due to schistosomiasis) and, in many cases, active infections with progressive disease (for example, tuberculosis, hepatitis B).

Second, adults in developing countries are being exposed to the growing health risks of an industrializing society—including higher consumption of tobacco, alcohol, and dietary fat, motor vehicle accidents, occupational injuries, chemical pollutants, and violence. In effect, the developing countries are now entering or, in some cases (for example, China, Brazil, and Mexico) have already entered, a very complex stage that presents unprecedented challenges to their health systems.[55]

Table 3

Percentage of Deaths from Selected Causes in India and China, Men and Women Ages 15-59

	Percent			
	India, 1986[a]		China, 1988	
Cause	Males	Females	Males	Females
Communicable diseases	**35.0**	**31.3**	**7.8**	**7.1**
Tuberculosis	17.8	10.9	3.8	3.5
Reproductive diseases	-	**9.3**	-	**1.8**
Non-communicable diseases	**45.2**	**43.3**	**72.0**	**70.3**
Circulatory	15.3	12.6	27.4	30.4
Cancer	4.4	6.7	27.3	24.6
Respiratory	8.3	7.7	3.4	3.2
Digestive	9.1	8.9	7.5	5.6
Injuries	**19.8**	**16.1**	**20.1**	**20.9**
Unintentional	12.1	10.9	14.3	10.9
Intentional	4.1	3.8	5.7	10.0
Probability of death between ages 15 and 65 (per 100)	32.8[b]	29.4[b]	14.3	11.9

a= Ages 15-54 in India

b= Estimated for India from life table

Source: Richard G.A. Feachem et al., eds., *The Health of Adults in the Developing World* (New York, Oxford: Oxford University Press for the World Bank, forthcoming).

India and China illustrate the diversity of diseases that may be seen in two developing countries with very different mortality levels (see Table 3). The risk of death between ages 15 and 65 in India is more than double that in China. While these data are not fully comparable, they do illustrate distinct patterns. Chronic noncommunicable diseases are the leading causes of death in both countries. In China, however, diseases of the circulatory system and cancer account for 55 to 60 percent of all deaths, while in India they account for less than 20 percent. Deaths from communicable diseases such as tubercu-

Table 4

Probability of Death by Cause for Chinese Men between Ages 15 and 60, 1987 Estimate

Cause	Probability of death (x 100)
Cancer	**4.3**
Liver	1.2
Stomach	0.9
Esophagus	0.7
Lung	0.6
Accidents	**2.7**
Motor vehicle	0.6
Falls	0.6
Cerebrovascular disease (stroke)	**1.7**
Respiratory diseases	**1.7**
COPD[a]	1.6
Heart disease	**1.5**
Coronary heart disease	0.7
Rheumatic heart disease	0.4
Hypertensive heart disease	0.2
Digestive diseases	**1.3**
Chronic liver disease	0.8
Infectious diseases	**1.1**
Tuberculosis	0.7
Suicide	**1.0**
Homicide and war	**0.3**
Endocrine	**0.1**
Diabetes	0.1
All causes	**15.0***[a]*

*COPD= chronic obstructive pulmonary disease. Pulmonary heart disease is included here.
Source: See Table 3.

losis are about four to five times higher in India. Reproductive mortality among women is also much higher in India, reflecting higher birth rates and the poorer health system. Proportionally, injuries contribute about the same to mortality in both countries.

Limited data are available from high-mortality areas in sub-Saharan Africa. However, a small longitudinal study carried out in rural Machakos, Kenya in 1975-78 found adult disease patterns similar to those in India.[56] Communicable diseases accounted for 35 percent of deaths; 16 percent of these were from tuberculosis. Noncommunicable diseases accounted for 43 percent of deaths and 18 percent of injuries.

Indirect evidence of mortality declines in developing countries over the past four decades can be derived from demographic analyses of censuses and surveys. However, direct evidence of how the causes of death have changed is extremely scarce, especially from high-mortality areas such as sub-Saharan Africa. The World Bank study cited above was able to examine longitudinal vital registration data from Chile, Costa Rica, Cuba, Singapore, and Sri Lanka from the 1950s to the present. These records indicated that the overall declines in mortality among adults were associated, in order of importance, with reductions in deaths from: 1) infectious diseases (particularly tuberculosis and respiratory infections); 2) maternity-related conditions; 3) digestive diseases; and 4) cardiovascular diseases. Deaths due to injuries did not change and in some cases increased substantially, offsetting the gains in survival produced by a decline in infectious diseases. As a consequence, chronic diseases and injuries accounted for a growing proportion and, with expanding populations, growing numbers of deaths in these developing countries.

China, where mortality rates have dropped rapidly, illustrates the diversity in causes of death referred to earlier. The pattern shown in Table 4 appears similar to that of a developed country. For example, in the United States, among adults age 25 to 64, the four leading causes of death are cancer, heart disease, accidents, and stroke. These are also among the top five in China. Closer examination, however, reveals major differences in the specific causes of death.

In China, many of the causes of death among adults relate to diseases and exposure to infections or toxic substances early in life. The single leading *specific* cause of death in China is chronic obstructive pulmonary disease (COPD), listed under respiratory diseases in Table 4. In the United States, COPD is predominantly a male disease and is related to heavy cigarette smoking. In China the rate of COPD is 10 times higher than in the United States, occurs about as often in females as males, and is somewhat more common in the rural areas. The causes are unclear but COPD appears to be related to a heavy exposure to indoor household smoke from open fires in combination with a high rate of acute respiratory infections.

The second leading *specific* cause of death is liver cancer, also very uncommon in the United States. Liver cancer in China results from lifelong infection with hepatitis B virus, often transmitted from infected mothers to their babies at birth. Hepatitis B is also a leading cause of chronic liver disease (cirrhosis) in China, whereas in the United States the leading cause of cirrhosis is alcoholism.

Coronary heart disease is the number one cause of heart disease death in China, similar to the United States. The second leading cause of heart disease in China is rheumatic heart disease, related to a different exposure history as well as different medical facilities. Most adult deaths from rheumatic heart disease in China are a result of chronic degeneration of the valves in the heart, a long-term consequence of untreated streptococcal infections (strep throat) in childhood. These deaths are extremely rare in the United States because of early treatment of strep infections and widespread availability of corrective heart surgery.

Tuberculosis (TB), the leading cause of infectious disease deaths in China, is also connected to childhood exposure. In large measure, TB deaths among adults represent a reoccurrence of disease from an infection acquired in early childhood.

This limited analysis demonstrates how complex health problems are among adults in developing countries. More than one-third of the leading causes of death among Chinese adults actually relate to childhood exposures. At the same time, in such a rapidly changing society, adults are also at increasing risk of motor vehicle accidents and the chronic diseases seen in the Western world—including lung cancer, coronary heart disease, and diabetes.

Although information on the causes of death among adults in most of the developing world is very incomplete, enough information is available to lead to a number of conclusions about priority health issues for the future. For example, growing urbanization is bringing a host of new health risks even as the old ones remain. Of particular concern are the problems connected with motor vehicle accidents, substandard working conditions, and the rising consumption of tobacco, alcohol, and junk foods.

Among the most serious health problems remaining in high-mortality settings, tuberculosis tops the list, accounting for about 20 percent of all adult deaths or 30 percent of all preventable deaths in this age group.[57] An estimated 3 million TB deaths occur annually—largely in the 15 to 59 age group—probably making TB the number one infectious cause of death worldwide. Newer antibiotics allowing for rapid short-course (three to six month) therapy make TB intervention programs cost-effective. The World Health Organization is leading the international community's efforts to deal with this long-neglected health problem in the developing world.

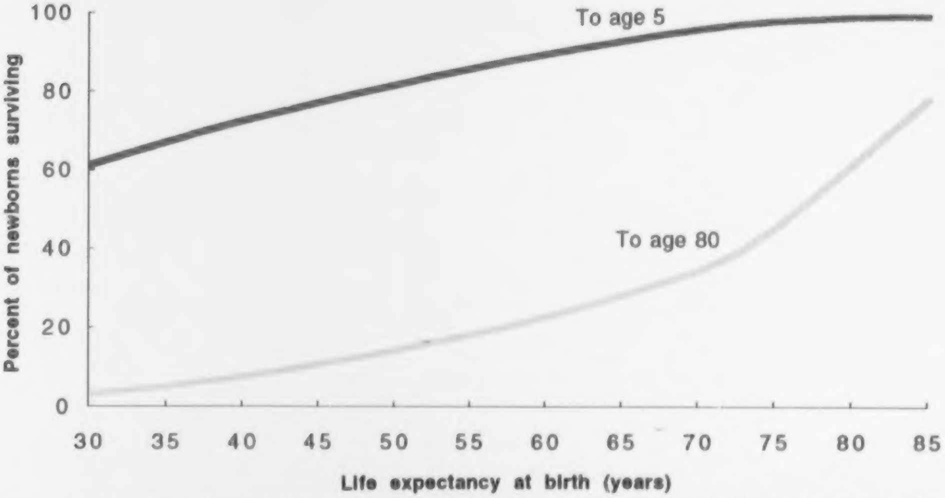
Among the most serious health problems remaining in high-mortality settings, tuberculosis tops the list, accounting for about 20 percent of all adult deaths

Hepatitis B is a leading cause of liver cancer throughout the developing world. Liver cancer is particularly prevalent in China, Southeast Asia, and Africa. With the recent availability of a vaccine for the hepatitis B virus costing less than US$1 per injection, there is now for the first time a vaccine against liver cancer. A number of countries, including China, Thailand, Indonesia, and The Gambia, have initiated or are planning national programs to immunize newborns.

Reproductive health, including maternal mortality and sexually transmitted diseases, generally has been neglected in much of the developing world. Recently, with a "safe motherhood initiative" promoted by WHO and the World Bank, the international community has granted higher priority to the prevention of maternal mortality. Although only about 10 percent of adult female deaths are related to childbirth, women in developing countries are from 100 to 500 times more likely to die in childbirth than women in industrialized societies. This amounts to about 500,000 maternal deaths annually, almost 99 percent of which are preventable.[58]

Figure 7

Survival to Ages 5 and 80 at Different Levels of Life Expectancy



Source: Ansley J. Coale, Paul Demeny, and Barbara Vaughan, *Regional Model Life Tables and Stable Populations* (New York: Academic Press, 1983); and Ansley Coale and Guang Guo, "The Use of New Model Life Tables at Very Low Mortality in Population Projections," *Population Bulletin of the United Nations*, no. 30 (New York: UN, 1991).

Until the advent of AIDS, sexually transmitted diseases in developing countries were essentially ignored even though these conditions debilitated millions of people. With the AIDS epidemic, the international health community and national health authorities now are giving serious attention to reducing the burden of these conditions.

Aging, Morbidity, and Disability: A Global Concern

The world's elderly population is projected to swell by 114 percent between 1990 and 2020. The magnitude of this increase, both relatively and absolutely, is far greater in less developed than in developed countries, as shown in Table 1, page 3. The inevitable consequence over the next several decades will be a rapid shift of the health problems of the aged from more developed to less developed countries.[59] In 1990, of 330 million persons over the age of 65, 56 percent lived in less developed countries. By the year 2020, 67 percent of the 706 million persons over age 65 will live in less developed countries and this proportion will continue to increase for decades.

Declines in mortality and fertility determine the dynamics of growth of the elderly population. The likelihood that a newborn will reach age 5 and age 80 as life expectancy increases is illustrated in Figure 7. At the extremes, with a life expectancy of 30 years typical of many developing countries a few decades ago, only 60 percent of newborns survive to reach age 5 and barely 3 percent reach age 80. At a life expectancy of 80 years, more than 60 percent of newborns will see their 80th birthday!

Although the world's population growth rates are slowing, the momentum for growth associated with past high fertility remains. On the basis of this momentum, the number of people 60 years or older will grow for 60 more years after births begin to decline, the population 80 years and older will grow for 80 years and so on. For example, in the United States, people born during the peak of the baby boom (1957) will not reach age 80 until 2037. Because death rates continue to decline, chances of survival for members of a birth cohort actually improve over time. The elderly population will not only continue to grow for many more years but also grow at a faster rate than any other age group.

Declines in mortality are not only adding to the numbers of the aged but also increasing their longevity. The question of whether the human population is reaching an upper limit of survival is one that vexes demographers as well as biomedical scientists. A recent analysis of long-term trends in life expectancy suggests that, barring a biomedical breakthrough that could increase the human life span beyond about 110 years, the ceiling in life expectancy for populations may be about 85 years for females and slightly more than 80 years for males.[60]

An aging population's increased morbidity and disability have substantial consequences for national health systems.[61] To investigate this, data for all Medicare-eligible persons over age 65 (representing approximately 95 percent of the U.S. population age 65 and over) were used to assess how much of the remaining years of life among the elderly at increasing ages actually represented active life expectancy.

An aging population's increased morbidity and disability have substantial consequences for national health systems.

Box 6

"Diseases of Affluence" and the Poor

Heart disease, high blood pressure, and cancer often are considered "diseases of affluence" because they are the leading causes of death in wealthy countries. In fact, the high-risk behaviors (like obesity and smoking) associated with these diseases are generally more common among the poor. Because the poor have limited access to good medical care, deaths from these "diseases of affluence" are much higher among the poor.

In the United States, the prominence of chronic diseases among the poor is strikingly manifested by the mortality differences between whites and African Americans. White Americans enjoyed a progressive gain in life expectancy in the 1980s, reaching 76 years in 1989. For blacks, life expectancy runs about six years lower. Part of this difference relates to infant mortality but it also reflects higher death rates among adults, particularly black men.

For black women, for example, the probability of dying between ages 15 and 60 is 16 percent; 79 percent higher than for white females. For black men, the risk of death during this age range is 30 percent, almost double that for white men,[1] and approaching the level for men in Bangladesh.

Nearly two-thirds of the excess mortality among African-American men in this age group has been attributed to cardiovascular disease and injuries. While black men are at a higher risk of homicide, this accounted for only one-fifth of the total difference. Eighty-one percent of the burden of excess mortality could be related to a combination of other lifestyle factors and, particularly, lack of access to quality medical care.

These same social differences are evident in developing countries. A study of mortality among males ages 45 to 64 in Porto Alegre, Brazil, in 1986 showed death rates were 30 percent higher for the poor than the rich with more deaths due to cancers, cardiovascular diseases, respiratory diseases, and injuries. In terms of risk factors and lifestyle, the uneducated in this same city were at greater risk from hypertension, alcohol consumption, obesity, smoking and lack of exercise.[2]

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Table 5

Expected Years of Life, Active Life, and Living in an Institution for the U.S. Elderly, 1983

Age	Total life expectancy		Active life*		Living in an institution	
	Males	Females	Males	Females	Males	Females
65	14.4	18.6	11.9	13.6	0.6	1.4
75	9.0	11.7	6.4	7.0	0.7	1.5
85	5.2	6.4	2.6	2.3	0.8	1.7
95	3.2	3.7	0.6	0.4	1.1	1.7

Years

* Years without disability

Source: Kenneth G. Manton and Eric Stallard, "Cross-sectional Estimates of Active Life Expectancy for the U.S. Elderly and Oldest-Old Populations," *Journal of Gerontology: Social Sciences* 46, no. 3 (1991): 170-182.

These results, summarized in Table 5, illustrate how sharply disability increases with age. For example, among females at age 65, only 13.6 years (73 percent) of the 18.6 years of survival remaining are active—without disability. This drops to 36 percent of the 6.4 years remaining to U.S. women by age 85; and by age 95 only 11 percent of the 3.7 years remaining are unimpaired. While females have a longer total life expectancy at every age, after age 85, males have fewer disabilities and a somewhat longer active life expectancy than females.

As survival increases, the crucial question becomes: How much of this gain represents more years of healthy life because of the elimination of diseases and how much represents the use of new medical methods to prolong the lives of persons afflicted with chronic diseases who otherwise would die? In the first scenario the gains in life expectancy would largely be gains in healthy years, while in the second scenario the gains would largely be disabled years, a situation labeled the "failures of success."[62] Obviously these different scenarios have major implications for health systems as well as the quality of life that can be anticipated as the world's population ages. The evidence on this issue is mixed.[63]

The more pessimistic view is based on the premise that gains in survival have been achieved by therapeutic interventions that simply delayed death among chronically ill persons.[64] If this is the case, then over time not only would the numbers of the elderly increase but also the amount of disability among the elderly. These persons have been termed "new survivors" who would otherwise have died but are now maintained alive for more extended periods.[65]

Several observations support this more pessimistic view. First, developed countries have a greater proportion of disabled people at all ages.[66] For example, in Australia in 1981, 6 percent of the 5- to 14-year-olds had some disability. By comparison, the disability rates for this age group ranged from less than 1 percent in countries such as Thailand, Tunisia, and Egypt to 2 to 3 percent in rural Ethiopia and the Philippines. At the other extreme, Australia reported 35 percent of adults disabled at ages 65 to 74 compared with only about 10 to 15 percent in Ethiopia, Mali, and the Philippines. While the comparability of these surveys is questionable, it should not be surprising that persons with moderate to severe chronic diseases (for example, diabetes) are far less likely to survive in developing countries where health services are scarce.

More important, are the gains in life expectancy now occurring in developed countries due to gains in disabled years or healthy years? Studies in the United States and Canada suggest that the larger proportion of the life expectancy gain between the 1950s and 1970s was in disabled years.[67] An analysis of recent gains in life expectancy found that the answer to the question "Are Americans living longer healthy lives as well as longer lives?" depends upon the definition of health and of disability.[68] If health means the ability to fully participate in normal activities of everyday life, the answer would be "no"; most of the gain in life expectancy between 1970 and 1980 was concentrated in years with a chronic disabling illness. On the other hand, if disability refers only to years spent in bed and the increase in life expectancy is measured only up to age 85, then the answer is "yes," the gain in life expectancy represents fewer bedridden years, although these years are not free of all disability. Either way, the results suggest that health-care systems must anticipate increased demand by a growing elderly population which will spend more years with a chronic disability.

A more optimistic view of current trends is described as the "compression of morbidity."[69] The evidence for this has been the dramatic reduction in mortality for chronic diseases in adults in recent years attributed to the prevention or postponement of the onset of these conditions rather than simply prolonging survival. For example, there have been actual declines in the incidence of heart disease, lung cancer, and automobile accidents.

"Successful aging" can be described as reducing the period between the age at which an individual suffers serious infirmity and the age at death. If medical systems continue to concentrate only on developing more sophisticated means of treating diseases after they are recognized, morbidity will increase, and health care will become more expensive. Already 18 percent of the U.S. health budget is spent on the last year of life. The alternative is to pursue even more vigorously the path of prevention and to provide social incentives to reduce risks and promote healthy behaviors.

The Relationship of Health to Wealth

A cursory inspection of the world health picture suggests that the single most important factor determining survival is income. At one extreme, Africa, with a per capita income of $600 (in U.S. dollars), has a life expectancy of 52 years while North America, with a per capita income of almost $20,000, has a life expectancy of 75 years. While a high gross national product (GNP) per capita is usually related to a high life expectancy, a number of low-income developing countries have managed to raise their average life expectancies closer to the levels of wealthier countries. Conversely, some countries with high per capita incomes still rank relatively low on measures of health and survival.

Table 6

Selected Developing Countries with High or Low Average Life Expectancies Relative to Their GNP Per Capita

Country	GNP/capita[a] U.S. dollars (1988)	Life expectancy years (1990)	Total fertility rate[b] (1990)	Percent literate (1985) Females	Percent literate (1985) Males
A. Life expectancy over 70 years with GNP/capita under $2,000					
China	$ 330	70	2.4	55	80
Sri Lanka	420	71	2.5	81	92
Jamaica	1,070	73	2.6	98	98
Chile	1,510	72	2.7	92	93
Costa Rica	1,690	75	3.2	92	92
Malaysia	1,940	70	3.7	65	83
B. Life expectancy under 65 years with GNP/capita over $2,000					
Saudi Arabia	$ 6,200	64	7.1	43	69
Libya	5,240	61	6.8	40	70
Oman	5,000	64	7.1	12	47
Gabon	2,970	53	5.5	43	70
Algeria	2,360	64	5.4	35	63

[a] Gross National Product per capita

[b] Average total number of children born per woman

Sources: World Bank, *World Development Report 1991* (New York: Oxford University Press, 1991); United Nations Development Programme, *Human Development Report 1991* (New York, Oxford: Oxford University Press, 1991)

Panel A of Table 6 lists six countries with a GNP per capita less than $2,000 that have a life expectancy of 70 years or greater. China and Sri Lanka stand out in this list with life expectancies of 70 and 71 years despite low per capita GNPs of $330 and $420, respectively. By comparison, of 21 other countries with GNPs in the range of $300 to $500, 18 have life expectancies ranging from 43 to 59 years. The six countries share a number of other characteristics which may explain their success in lengthening life expectancy. All have relatively high levels of literacy among women as well as men, indicating a long history of investment in education with attention to equity for women. Correspondingly, fertility rates are relatively low in each of these countries.

Yet, wealth does not necessarily bring health. Panel B of Table 6 lists countries that have a per capita GNP of $2,000 or greater and life expectancies less than 65 years. With one exception, all are in North Africa. Overall literacy levels are lower, but the most striking difference is

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Improving the education of women can lead to a healthier population.

between men and women, indicating the lower status of women in these societies. Correspondingly, total fertility rates are high, a reflection that women have fewer opportunities to participate broadly in these societies. The roles of women in some Islamic countries are limited to childbearing and childrearing. The per capita public expenditures for health services in Saudi Arabia ($248) and Libya ($163) are 20 to 50 times greater than those in China ($5) or Sri Lanka ($7), suggesting that good health is not necessarily produced by spending money on sophisticated hospital care.

In 1985, the U.S.-based Rockefeller Foundation convened an international conference in Bellagio, Italy on the theme "Good Health At Low Cost" to explore why a few poor developing countries and regions manage to achieve such remarkable gains in health.[70] Selected for in-depth analyses were China, Sri Lanka, Costa Rica, and the state of Kerala in India. The latter region was chosen because, although it was among the poorest states in India (the per capita income was $160 in 1981-82), it had already achieved a life expectancy of 69 years.

The Bellagio conference concluded that good health in poor countries can be achieved if there is a political commitment to equity. This commitment must be translated into policies and programs that assure, as far as possible, wide access to basic health services, education, and food. The four case studies indicated that to guarantee access to health care, governments must work to overcome the social and economic barriers that can exist between disadvantaged groups in the population and medical services. A common characteristic in these countries was that they set their own priorities and strategies for health programs. The approach to a specific disease problem, such as diarrhea, was multifaceted—involving social and environmental interventions as well as the introduction of medical technologies through a well-managed and accessible health system.

Conclusion

In the first three decades following World War II, the major thrust of health programs was biomedical and technical. This was associated with dramatic declines in infant and child mortality in developing countries as well as significant advances in curing or prolonging the survival of persons with chronic diseases in developed countries. By the 1970s, however, there was growing evidence that a hospital-based, curative strategy was failing to meet health needs and was increasingly expensive. At the same time, a convergence of evidence from the biomedical and social sciences was laying the groundwork for a new approach to improving the health of populations. This was manifested differently in developed and developing countries.

In developed countries, it was becoming increasingly apparent that many of the chronic diseases among adults were not the inevitable consequence of modernization but rather the result of unhealthy behaviors, diet and lifestyle. The Canadian Minister of Health issued a White Paper in 1974 which documented the relationship between lifestyle and disease. The following year, the U.S. Centers for Disease Control issued a study which estimated the proportional allocation of factors contributing to mortality from the 10 leading causes of death; unhealthy lifestyles contributed about 50 percent while impairments in the medical system accounted for only 11 percent. In 1979, the U.S. government moved closer to a national program of health promotion and disease prevention with the publication of "Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention." Other industrialized countries were developing strategies for promoting healthier lifestyles. The efforts by Western countries have resulted in substantial improvements in health, especially among adults, in the 1980s.

In developing countries, it was also becoming clear by the 1970s that the Western medical model of urban-based hospitals and health centers was not meeting the health needs of the people. But a few countries—whose health systems focused on reaching all the people with essential services and promoting basic hygiene and good dietary practices—were achieving substantial health gains. These successful examples led UNICEF and the WHO to convene an International Conference on Primary Health Care in 1978 in Alma Alta, then in the Soviet Union, which emphasized community-based health programs and universal access to essential services.

In the 1980s, the primary health care movement was translated into a global child-survival strategy by the international donor community. This strategy sought to bring the world's children a few effective technologies—such as immunizations and oral rehydration therapy to combat diarrhea—along with information on breastfeeding, nutrition, and hygiene to reduce mortality from infectious diseases. The achievements toward this goal have been remarkable.

The promotion of healthy lifestyles in developed countries and the child-survival campaign in developing countries should be looked on as the precursors of a revolutionary shift in worldwide health policy and program strategy. This preventive approach to improving health recognizes that all sectors of society must be involved in the production of health, not just the medical profession or government health department. These new strategies to promote health will be political, economic, and social, with the objectives of reducing environmental hazards, providing information and basic services, and motivating persons so that health risks and unhealthy behaviors are reduced, precursors to disease are identified early, and healthy lifestyles become the norm.[71]

The biomedical and social sciences will be needed more than ever before to move this new strategy forward: the biomedical sciences to increase knowledge about the precursors of disease and to develop and improve technologies for disease control on a population-wide basis; the social sciences to learn how to apply this knowledge to health problems in diverse societies. To move ahead, governments must begin to consider how their policies in every sector can promote or impede the health in their populations. And they must engender the political will to make human welfare a high priority.

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Discussion Questions

1. Compare and contrast the conditions affecting infant and child mortality in developed and developing countries. Explain the relationship between family planning and child survival.

2. Outline the health-care experiences (for example, doctor visits, hospitalization, or preventive care) of a person living in a developed country at different stages of life: during infancy and childhood, young adulthood, middle age, and old age. How might this differ from the experience of a person living in China, India, or sub-Saharan Africa?

3. How does a population's age structure affect the demand for health-care services?

4. How might the growing prevalence of AIDS influence the type of medical care available in a society? Use specific countries or regions to examine the impact of AIDS on the mortality and morbidity of the general population.

5. Contrast morbidity patterns in developed and developing countries.

6. List specific factors that have led to gains in life expectancy in developed nations. How do these differ from improvements in life expectancy in developing nations?

7. How does urbanization affect patterns of mortality and morbidity in a society?

8. Discuss the factors that might account for Japan's low mortality rate.

9. What changes are occurring in the U.S. health-care system as the population ages? What changes are ahead for the health-care system in the next century?

10. Give examples of how transportation and access to global information have transformed both the spread and the treatment of disease.

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by H. Yuan Tien, with Zhang Tianlu, Ping Yu,
Li Jingneng, and Liang Zhongtang

35 births per 1,000 in the 1950s to 20 per 1,000 in the 1990s. This Bullet
examines the development and consequences of the strict population
planning control measures introduced in the 1970s, and strengthened in
the early 1980s. Success of these measures has led to a rapid aging of th
population, a marriage squeeze, charges of female infanticide, and
international approbation and censure. Meanwhile, the huge momentum
of the Chinese population base has continued to add 17 million persons
annually; and the total is expected to top 1.3 billion by the year 2000. Th
growing numbers exert considerable pressure on urban areas, as well as
country's labor force, and education and health systems. Although econ
development and reforms have improved life for many Chinese, there i
widening gap between residents of rural and urban areas. In addition,
industrialization, combined with China's large population, are contribut
to a serious deterioration of the country's natural resources.

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China's Demographic Dilemmas

By H. Yuan Tien, with Zhang Tianlu, Ping Yu, Li Jingneng, and Liang Zhongtang

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Note: The views of the author do not necessarily reflect those of the contributors or the Population Reference Bureau.

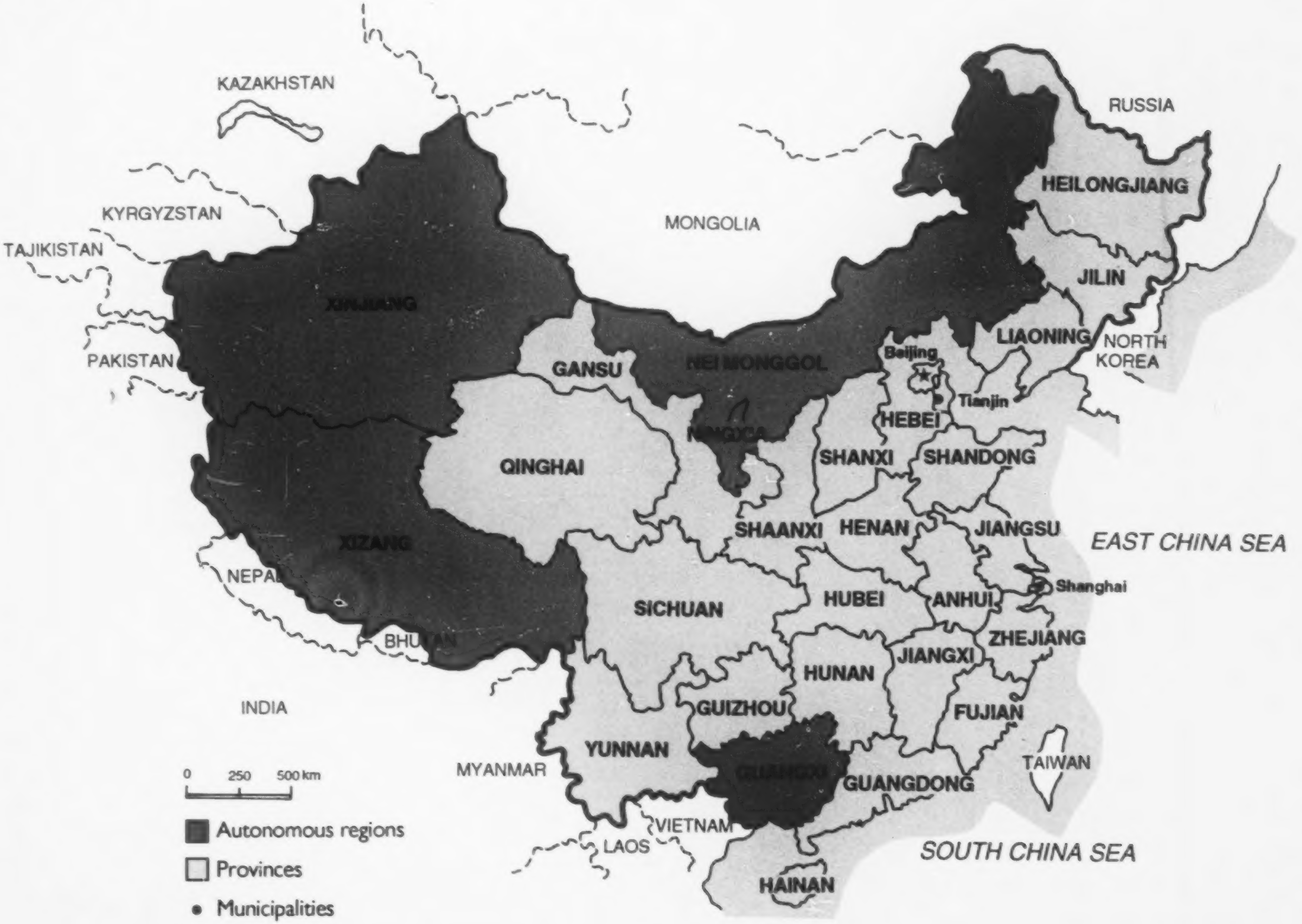
The year 2000 will mark the end of the most tumultuous century in China's population history. In a country that has weathered the demographic effects of devastating famines, wars, and epidemics for millennia, the population growth and change that occurred in the 20th century have no precedent. At the dawn of this century, there were some 426 million people living in China. By the year 2000, the Chinese population is officially projected to top the 1.3 billion mark. About two-thirds of this nearly 900 million increase was added within the last 50 years, as mortality was reduced amid high fertility rates.

The impact of this rapid surge in "demographic affluence" sapped the Chinese government's professed faith in the virtue of a large and growing population and spurred a move to curb fertility. China's strategic demographic initiatives (here referred to as SDI)—born out of population anxieties fanned by the nation's economic aspirations and realities—were a milestone in the world's annals of population affairs.

China's population policies are comprehensive in scope and unique in thrust. The government installed a full menu of measures for curbing fertility, embracing delayed marriage, sterilization, all known contraceptive methods, and abortion. Exhortations, campaigns, monetary and material incentives, and numerous other sanctions were applied to implement the policies. All these efforts were, at first, to redirect young couples to have fewer offspring and, later, to heed the one-child-per-couple, or "minimal reproduction," policy.

The intent of this call for minimal reproduction was to keep the population from exceeding 1.2 billion by the year 2000. The tactics have proved problematic inside the country and controversial abroad for practical, political, ethical, and religious reasons. Moreover, the hoped-for population goal has become moot in light of the higher projected population total for the beginning of the 21st century. Does this mean that China's bid to control

Figure 1
The People's Republic of China, 1990


KAZAKHSTAN
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LAOS
VIETNAM
EAST CHINA SEA
SOUTH CHINA SEA
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HENAN
JIANGSU
Shanghai
SICHUAN
HUBEI
ANHUI
ZHEJIANG
HUNAN
JIANGXI
GUIZHOU
FUJIAN
YUNNAN
GUANGXI
GUANGDONG
TAIWAN
HAINAN
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Autonomous regions
Provinces
Municipalities

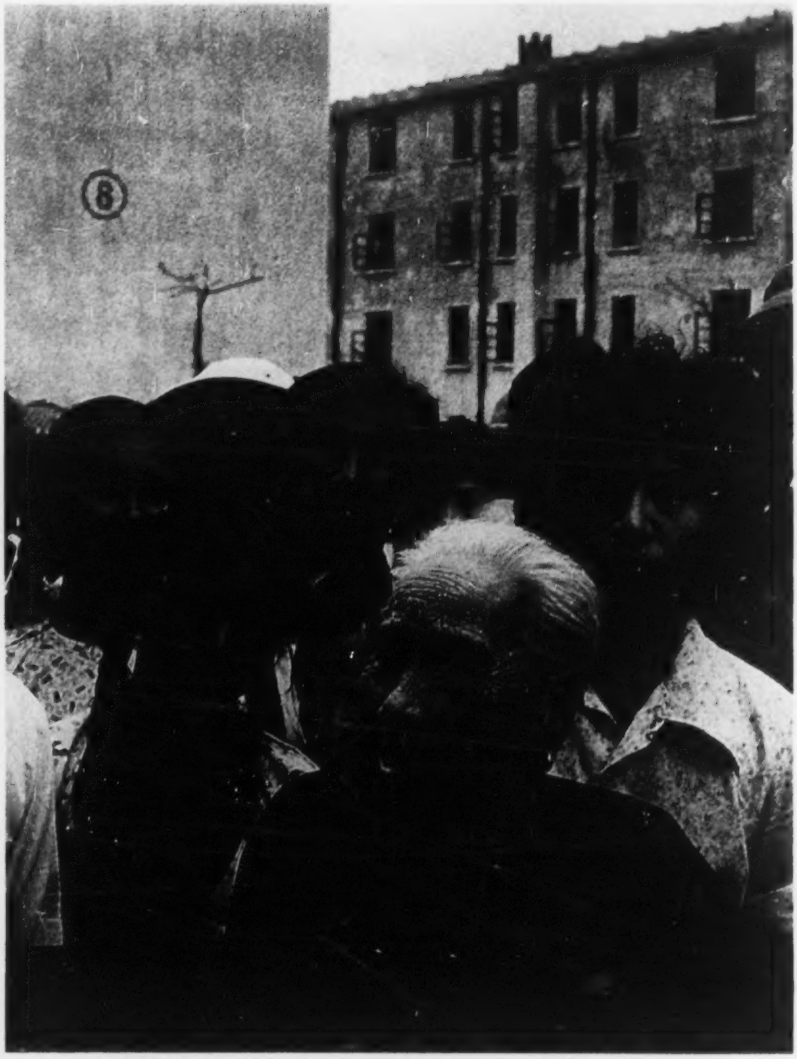
population growth has been flawed or a failure altogether? If it has failed, why and where has it foundered? If not, what has China's SDI accomplished?

The massive gain in population in recent decades has intensified old difficulties in the country's effort to raise living standards, and ignited new economic, environmental, and social concerns within the nation's borders. The major issues range from China's population carrying capacity, underemployment and unemployment in the countryside, surging urbanization, and spreading air and water pollution to mass illiteracy and education in relation to development. The national effort to slow population growth itself has added such new concerns as the effect of son preference on female infanticide and the sex ratio, the impact of a speedy fertility transition on population aging, and the implications of exempting the country's 55 minority groups from the nation's fertility control measures.

The global significance of China's demographics is likewise enormous. Whatever the size of China's total population at the dawn of the 21st century, it is certain to account for close to 20 percent of the world's projected population of 6.3 billion. China's industrialization, modernization, expanding use of natural resources, and rising consumption will increasingly disrupt the earth's ecosystem.

Population size, growth, and control are the most pressing challenges affecting China's demographic future. Old and new problems of population distribution and composition, however, are no less urgent. This *Bulletin* examines these and other issues affecting the present and future well-being of the Chinese population.

UNHCR/A. Casella



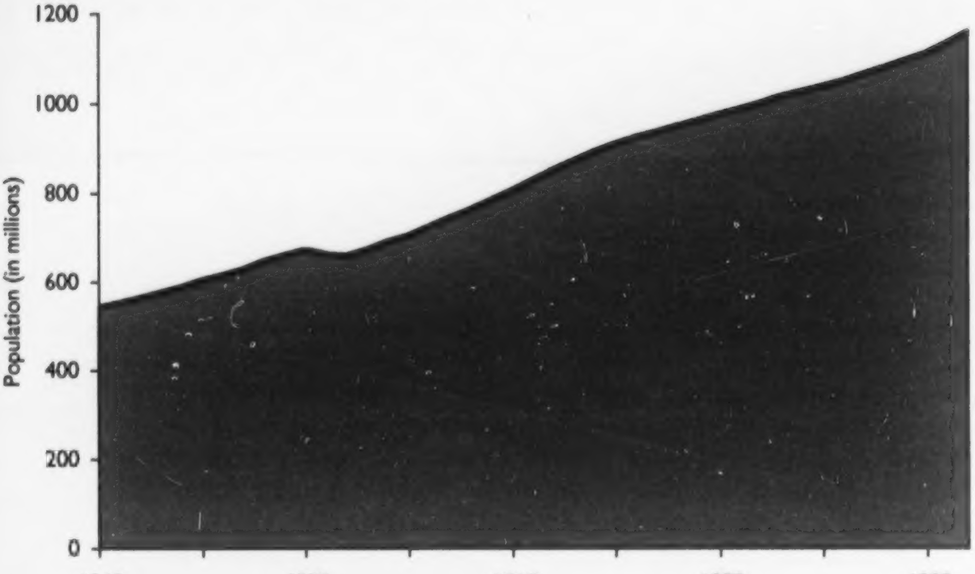
China's 1.2 billion people make up one-fifth of the world's total.

Demographic Surge During the 20th Century

China's population total first passed the 400 million mark about 1850. This landmark event had its quiet beginnings in the late 1600s as living conditions improved enough to support sustained, slow population growth over the following two centuries. But, amid internal upheavals and external incursions, demographic growth stagnated. The population hovered around 426 million as the 20th century opened.

Internecine warfare, natural calamities, and foreign invasions continued to play havoc with China's hundreds of millions during the first half of the present century. Incomplete population counts reinforce the perception of demographic stagnation. The first national census, taken in 1953 after the

Figure 2
Population Growth in China, 1949-1990



Source: National Family Planning Commission of China.

end of the civil war and the establishment of the People's Republic in 1949, recorded a larger than expected population of 583 million. Since then, there have been three additional national enumerations in 1964, 1982, and 1990.

In between the censuses, year-end population estimates appeared intermittently. The quality of these estimates suffered in part because of the 20-year neglect of demographic affairs and studies in China after 1957.

The censuses of 1953 and 1964 were limited in content and yielded only a few hand-tabulated statistics. The very existence of the 1964 census was not confirmed until 1979. But in the more open climate of the 1980s, the Third National Census in 1982 gained an international audience. Tabulations were accelerated by the computer technology China received under a financial and technical aid agreement with the United Nations Population Fund (UNFPA). The collection of the most massive amounts and varied sorts of population data ever was an internationally important success. For the first time, it produced relatively accurate information about China's population circumstances.

The 1982 census enumerated a higher population total than had been estimated by the National Statistical Bureau. It also provided the first solid basis on which to evaluate previous population estimates, and confirmed China's emergence as the world's first demographic billionaire just before the end of 1981 (see Figure 2).

The Fourth National Census in 1990 placed the total population at 1.134 billion. This new total revealed that estimates during the intercensal period once more understated China's population size. At the end of 1989, the year-end total was estimated at 1.112 billion, 21.7 million below the census total only six months later. China's population had grown faster during the 1980s than previously estimated.

The sheer enormity of the surge since 1950 is reason enough for a close scrutiny of China's newest population chapter. However, what has made this chapter most intriguing and extraordinary goes beyond the swelling numbers; it is the events and policy changes that accompanied the surge.

China's Demographic Transition

The events that unfolded since the 1950s are part of one of the fastest, if not the fastest, demographic transitions in history. Most industrialized countries underwent a fundamental shift from extremely high to low mortality and fertility rates in the 19th and 20th centuries, and many expect today's developing countries to experience the same sort of demographic transition. Characteristically, mortality rates fall first as a result of improved hygiene and living standards, followed by declines in fertility. China's demographic transition took place within recent decades, a fraction of the time it took for European and other industrialized countries to realize low fertility and mortality.

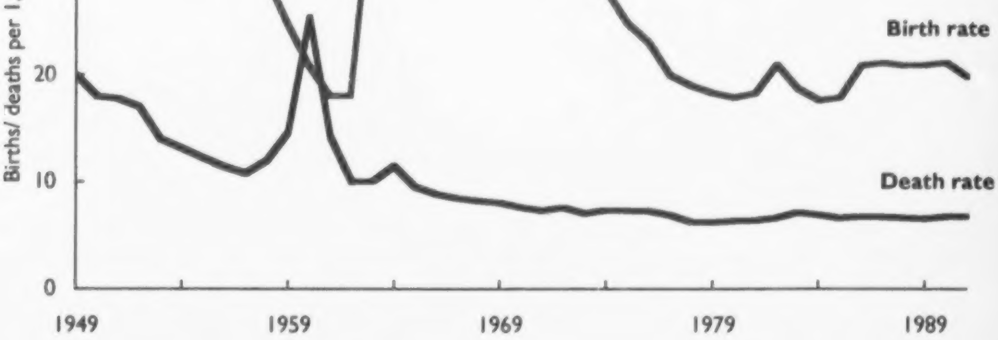
In most of the years between 1949 and 1974, the annual gain in population exceeded 2 percent. The few exceptions resulted from severe policy errors and natural disasters. Widespread famine followed the Great Leap Forward in 1958-1961, readily evident in the sharply higher death rates and plummeting birth rates in these years (see Figure 3). China's population actually declined during this period, but growth quickly rebounded after 1961 as the birth rate resumed its traditionally high levels when economic conditions improved.

Had the pace of the mid-1960s persisted, the Chinese population would have doubled to more than 1.1 billion in the mid-1970s. Because of the subsequent sharp drop in fertility, China did not reach this total until the end of 1989. Behind this 15-year postponement lay China's phenomenal demographic transition from high to low fertility. The annual rate of growth dove to and has hovered around 1.5 percent or less since the mid-1970s, making earlier growth rates appear to be from a different nation.

This slowdown in the growth rate is remarkable even though, as will be shown later, disagreement has been loud and long over its salience in relation to China's on-going economic

Figure 3

Birth and Death Rates in China, 1949-1991



Source: National Family Planning Commission of China.

development and to the nation's population carrying capacity.

China's rapid demographic transition took the world by surprise. Few had foreseen the possibility of such a quick remission in growth. Perhaps, the politics of population numbers or the scarcity of demographic data or both hindered clairvoyance in this case.

The initial reductions in mortality illustrate the new government's success in improving health and living standards. With peace restored within and medical technology borrowed from without, the shift to lower mortality—the first component of its demographic transition—quickly followed. Most of the mortality improvement was realized by the end of the 1960s. The subsequently lower rates (7 deaths per 1,000 population, or lower) largely reflect the young population age structure shaped by high fertility.

Average life expectancy at birth soared from less than 42 years in the 1950s to about 67 years by the end of the 1980s. By world standards, China's life expectancy is high given its relatively low per capita income. Infant mortality also fell sharply over the past four decades. Nearly 200 of every 1,000 babies died before age one in the early years of the People's Republic. By the early 1990s, many more newborns were surviving to adulthood. The infant mortality rate had fallen below 40 deaths per 1,000 births.

Falling Fertility

Birth rates in the high-30s and low-40s persisted for almost two decades after 1949. The sharp rise in rates after their precipitous fall between 1959 and 1961 underscores the speed with which fertility can resume its traditional level once adverse circumstances subside.

With falling death rates, continued high fertility caused the population to boom. During the late 1950s, a brief attempt was made to promote family planning in the interest of maternal and infant health. It produced only a fleeting impact, as did the next short-lived revival of family planning efforts during the early 1960s. The fits and starts in promoting fertility limitation reflected, among other things, the political tune of the day: "Revolution plus production," as Mao Zedong proclaimed in 1949, would enable China to feed and employ the country's large and growing population.[1] This authoritative pronouncement, rooted in part in an absence of understanding of demographic dynamics, helped keep fertility at the prevailing high levels.

The total population topped the 800 million mark at the end of 1969, and growth continued unabated as the crude birth rate persisted above 30 births per 1,000 population. Meanwhile, new policy measures aimed at energizing the economy, such as the Great Leap Forward and the People's Communes, failed to increase productivity or living standards. The economy stagnated, the population continued to expand, and there seemed no way out of the predicament.

These rapid twists and turns of events—and continuing efforts to develop—prompted the launching of China's SDI. As a result, Chinese fertility decelerated, plummeting nearly 50 percent between 1970 and 1979, from 34 to below 18 births per 1,000 population. No further large drops have occurred, which suggests that the limit to population planning may have been reached given China's current socioeconomic circumstances. In the 1980s, however, various revisions in population control measures, changes in the age structure, and fluctuations in age at marriage operated to lift fertility a little from the all-time lows of the late 1970s. The birth rate fluctuated around 21 during the 1980s, and the 1991 birth rate estimate was only slightly lower, at 19.7 births per 1,000.

The deceleration in the reproductive cadence in China after 1970 was remarkable. China brought about the second dimension of the demographic transition, low fertility, in less time than it took to realize mortality reductions. More noteworthy, the huge slowdown in

Chinese fertility decelerated, plummeting nearly 50 percent between 1970 and 1979.

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Ethnic minorities, numbering 91 million in 1990, are exempt from the one-child-per-couple policy.

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childbearing was achieved in one decade, far less than the 50 to 75 years most European countries took to accomplish their fertility transition.

In speed and scope, China's demographic transition is extraordinary even compared with other Asian countries such as Thailand, South Korea, and Japan, which have undergone rapid fertility declines since 1950. The deployment of China's revolutionary SDI is a watershed for what is the most comprehensive, determined, and successful effort ever made to regulate population growth in any modern nation.

What was the thinking behind this all-out attempt to lasso fertility? How did the efforts succeed in lowering birth rates in a society still undergoing socioeconomic development? Why did the population planning programs succeed when other government-directed programs, such as the Great Leap Forward and People's Communes failed? What can other developing countries learn from China's experience? The evolution of the Chinese approaches to and achievements in managing population affairs are what make China's newest population chapter especially engrossing.

The Struggle to Regulate Fertility

China's theories and policies toward population growth have undergone profound changes during the last three decades. The first moves to promote population planning, in the 1950s and again in the early 1960s, extolled fertility control in the name of maternal and infant well-being. China's population planning activities since the early 1970s have differed in both rationale and range from the two short-lived campaigns of the earlier years. The more recent effort was a response to the surge in numbers and concomitant difficulties. It has become an integral part of the nation's economic development plans and, as it blossomed into China's SDI, it is meant to serve the collective interest of the whole country.

The aim of the population planning efforts of the early 1970s was to slow the demographic clock to better cope with existing population-related problems. The approach to lower birth rates was embodied in the flexible *wan, xi, shao* campaign—meaning later marriage, longer spacing between births, and fewer children.

Toward the end of the 1970s, party policymakers defined new economic targets for the year 2000, lending more urgency to the population planning efforts. A demographic ceiling was identified: the population was not to exceed 1.2 billion at the end of the century. This goal and the adoption of the now renowned one-child-per-couple policy during 1978 and 1979 would not only allow the country to realize the 2000 goal but eventually to shrink the total to conform to the country's assumed population carrying capacity. Not only was the demographic clock to be stopped before midnight, but its hands were to be moved backward.

The population planning policies of the 1970s initially lacked the usual theoretical justification for such an all-out government intervention. The call for population planning stressed the need to end the intolerable state of "total anarchy" in procreation[2] which bestowed political legitimacy on population control. However, maternal and infant welfare remained the primary rationale cited in internal discussions and at international gatherings.[3]

Finally, population specialists at the newly established Office of Population Theory Research of the Beijing College of Economics fleshed out a new socialist principle of direct government intervention in family formation. The work was published as *Renkou Lilun (Population Theory)* in 1977.[4]

Under the rubric of the theory of proportionality of production and reproduction, the rationale for population planning may be summarized as follows: Human reproduction, like the production of goods and services in a planned economy, must not remain in a state of anarchy. Childbearing is not only an individual and family matter, it also affects the nation's total population size, the socialist revolution and socialist development. The dissemination of contraceptive knowledge and technology in China is more than a matter of couple-centered and couple-managed family planning in accordance with the couple's interest and inclination. It is to place childbearing in each and every household on the track of the nation's unified plan.[5]

More important, these population specialists averred, "Our nation's control

Gu Dehua

Twin baby girls assure this mother more than one child, but no sons.

of population growth ... certainly does not mean no population growth and, indeed, it does not imply population reduction.... It is only a matter of making the rate of population [growth] a little slower according to plan."[6]

These expanded rationales contained neither the idea of zero population growth nor the one-child policy and the strong incentives and sanctions to encourage compliance with fertility goals. They also proved conspicuously short on tactics of implementation. This left a vacuum which others filled by recasting the guidelines in more explicit and stringent terms. Indeed, 20 years of neglect of demographic studies had created an enormous void of expertise in demography, providing ample opportunities for new participants in population policymaking.

During this same period, officials were attempting to forge the nation into a powerful socialist country based on the "four modernizations" of agriculture, industry, defense, and science and technology. They further envisioned *xiaokang shuiping,* or the attainment of a "comparatively comfortable level of living," by the century's end, which called for the quadrupling of the total industrial-agricultural output between 1981 and 2000. Rapid population growth was viewed as an impediment to these economic goals, and some policymakers advocated stringent limits and stronger measures.[7]

The one-child idea at the national level emerged, interestingly enough, along with the renewed access to demographic literature from abroad as China began to open its doors in the 1970s. The notion of zero population growth (ZPG), by all accounts, was an American import.[8] Just as its simplicity had captivated many in the United States where foreign immigration was a growing demographic concern, in China it attracted various natural scientists with direct access to the highest levels of population policymaking. They may have grafted it onto China's population planning effort under the stress of meeting the 2000 goals[9] without fully ascertaining its background and ramifications. This was the likely origin of the one-child-per-couple limit and other ideas well outside the original framework "of achieving socialist planned reproduction with Chinese characteristics."

The Chinese birth rate had already fallen to its lowest recorded level by the time the stringent goals were adopted.

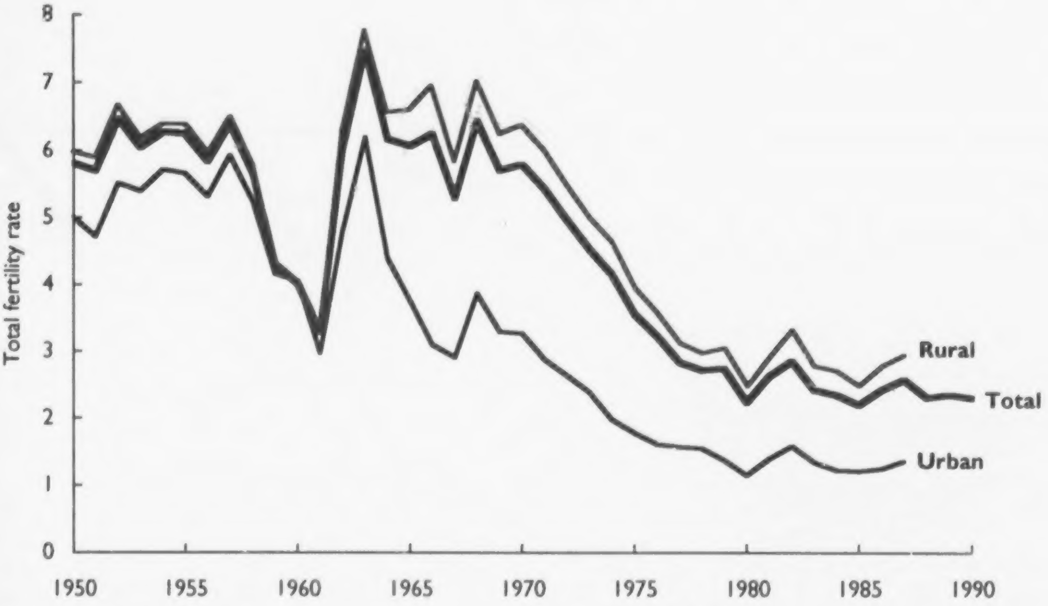
In *Population Control in China,* a volume later published in the United States, proponents of exact population goals developed the arguments in favor of minimal reproduction. The authors also included such notions as optimum population and population carrying capacity, ideas that had elicited fervent exchanges but few conclusions among scholars of diverse disciplines before World War II.[10] For China, in their reckoning of the country's population carrying capacity in terms of land resources, nutritional requirements, fresh-water resources, ecological equilibrium, and economic development, "the [ultimate] target population of 700 million cannot be said to be unfounded," and "the best way to stabilize China's population at the target level" would be to implement the one-child limit until at least the end of the century. Otherwise, "the [Chinese] population will remain a time-bomb waiting to be detonated."[11]

The Chinese birth rate had already fallen to its lowest recorded level by the time these stringent goals were adopted, as shown in Figure 3, page 6. The less stringent fertility reduction embodied in the *wan, xi, shao* campaign and of the fertility concept that "one [child] is not wanting, two are good, and three are excessive," were working. China's total fertility rate (TFR), or average number of lifetime births per woman at current age-specific birth rates, fell from 6 in the 1950s to around 3 before the start of the policy of minimal reproduction in 1979 (see Figure 4).

The ideal of only one child proved controversial in China[12] and its implementation provoked strong resistance. There were strong misgivings among those at the provincial and grassroots levels about the one-child policy. Local

Figure 4

Decline in Chinese Fertility, 1950-1990



Source: Compiled by the U.S. Bureau of the Census, Center for International Research.

officials advocated sanctioning a second child after an appropriate interval. A second child provides additional labor important to parents in the countryside, particularly in the most impoverished areas. It is also a second chance to realize the aspirations of many parents for a son should their first child be a girl. The realities of real hardship and gender preference fostered covert resistance to the one-child limit, which, in turn, compounded the difficulties for local cadres in implementing population planning.

Some have also argued that economic reforms begun in 1978 may have weakened the enforcement of population policies,[13] but the effect of these reforms on actual fertility remains speculative. After 1978, the family was restored as the basic unit of production in the countryside, altering the rural infrastructure and loosening the social control of the communes. Coincidentally, the birth rate rose slightly in the early 1980s. Some interpreted this rise as a sign that peasants were having more children to bolster their family labor supply. More likely, the birth rate was pushed up temporarily by shifts in the age structure, a rise in marriages, and changes in population planning regulations. For most of the 1980s, the birth rate hovered around the level attained before the economic reforms or the one-child policy were in effect.

The impact of China's policy of minimal reproduction has been limited. The TFR never fell below a 2.5 child-per-woman average in rural areas, although it dropped to about 1.2 in urban areas. By the mid-1980s, less than one-fifth of all eligible married couples had signed the one-child certificate—a contract which granted couples and their child economic and educational advantages in return for promising not to have more than one child. Throughout the 1980s, nearly half of all reported births were second, third, or higher order births.[14] Various surveys suggested that the desire to have at least two children remained strong among Chinese couples.[15]

Acquiescing to widespread aspirations for a second child, Peng Peiyun, the head of the National Family Planning Commission, declared in 1988, "In the countryside, couples will now be allowed a second chance after an appropriate interval should their first child be a girl." More noteworthy, as one population specialist on the staff of China's Population Information and Research Center related, "All through the years of China's sixth five-year plan (1981-1985), and at present, the great majority of Chinese peasants have all borne two children or more."[16]

Young couples in China are having fewer children than their parents' generation. The 1990 TFR of 2.3 was less than half the rates of the 1960s. Couples of reproductive age thus have adhered to the general terms of China's SDI, but simultaneously demonstrated their resilience and resourcefulness in realizing their aspirations for more than one child. One lesson to be drawn from China's experience is: To slow down the demographic clock, yes; to reverse the demographic clock, no! The actual behavior of couples thus has most poignantly set the limits to population planning under China's current socioeconomic circumstances.

Table 1

IUD Insertions, Sterilizations, and Abortions in China, 1971-1989 (in millions)

Year	IUDs	Sterilizations Female	 Male	Abortions	Total
1971	6.2	1.7	1.2	3.9	13.1
1972	9.2	2.1	1.7	4.8	17.8
1973	14.0	3.0	1.9	5.1	23.9
1974	12.6	2.3	1.4	5.0	21.3
1975	16.7	3.3	2.7	5.1	27.8
1976	11.6	2.7	1.5	4.7	20.6
1977	13.0	2.8	2.6	5.2	23.6
1978	11.0	2.5	0.8	5.4	19.6
1979	13.5	5.3	1.7	7.9	28.3
1980	11.5	3.8	1.4	9.5	26.2
1981	10.3	1.6	0.6	8.7	21.2
1982	14.1	3.9	1.2	12.4	31.6
1983	17.8	16.4	4.4	14.4	53.0
1984	11.4	5.7	1.5	8.9	27.4
1985	9.6	2.3	0.5	10.9	23.4
1986	11.4	3.0	1.1	11.6	27.1
1987	14.7	5.1	2.0	10.4	32.2
1988	14.5	4.9	1.7	12.7	33.8
1989	15.5	6.3	2.4	10.6	34.8

Note: The sums of the rows may not equal the totals due to rounding.

Source: *China Population Data Handbook* (Beijing: China Population and Research Information Center, various years).

Outside China, the one-child-per-couple policy has aroused strong reactions. In addition to questioning the right of a government to intervene in a couple's reproductive matters, there are strong misgivings about the reported coercion of women to have an abortion or an IUD-insertion. Others object for moral reasons to the strong role of abortion and sterilization in the Chinese population planning effort. Under intense pressure from groups critical of China's policies, the U.S. government has withheld its contribution to the UNFPA since 1985.[17]

Methods of Fertility Control

Widespread access to family planning methods was a hallmark of China's population planning program. Contraceptive use by women of reproductive age had already reached 71 percent by 1982, close to the level in most developed countries and well above the rates in other Asian countries. In Thailand, South Korea, and Indonesia, for example, contraceptive use ranged from 25 to 50 percent in the early 1980s. By 1990—still ahead of other Asian countries—contraceptive use had reportedly risen above 85 percent in China, compared with about 77 percent in South Korea, 66 percent in Thailand, and 50 percent in Indonesia.[18]

Although many other birth control methods were available, over 80 percent of Chinese using contraception in 1982 relied on one of three methods: IUD, female sterilization, or male sterilization. Abortion was the backup method. The heavy reliance on these three contraceptive methods and abortion has continued.

Between 1971 and 1989, the number of IUD insertions, sterilizations and abortions nearly tripled, from 13 to 35 million procedures (see Table 1). Male sterilizations doubled, female sterilizations almost quadrupled, and abortions and IUD insertions increased by two and one-half times. Although negative publicity about IUDs was practically nil, it swelled and swirled around the other procedures. "Coercive planned parenthood" has been alleged internationally, with the pitch of outcries particularly high in the United States.[19] The gathering squall abroad over sterilization and abortion in China gained strength as China's own mass media disclosed evidence of improprieties committed by local planning units.

Chinese mass media and official pronouncements have treated sterilization and abortion differently. Exhortations to males to accept vasectomy became particularly frequent after the availability of a plastic plug injection technique in the 1970s enhanced the reversibility of the procedure.

In reality, the lion's share of the responsibility for birth control rests with women in China, as it does elsewhere. Tubectomies exceeded vasectomies each year between 1971 and 1989, sometimes by three or four times, as shown in Table 1. Women in all countries typically have more experience with temporary methods of birth control than men and may be more motivated to seek a permanent solution.[20] In China's case, women who were in a clinic for childbirth often were pressured by the local population planning cadres to accept sterilization. Many mothers with at least one previous birth were persuaded to undergo tubectomy on the spot. This approach meant that women (or men) who accepted sterilization generally did so after age 30 and after having borne two or more children, perhaps rendering sterilization less controversial than abortion.[21]

Although contraceptives and sterilization are used by over 80 percent of Chinese women of reproductive age, contraceptive failure and nonuse are a present-day reality. Chinese IUDs have a relatively high failure rate of 10 to 15 percent, compared with a 1 percent failure rate for most European or American IUDs. Abortion was an important backup method during China's rapid fertility transition, and, with the more stringent goals and policies of the 1980s, it has assumed an even greater role. China's population planning officials estimate that 70 percent of abortions are due to contraceptive failure.[22]

The reported ratio of abortions to births in China increased from below 200 per 1,000 live births in 1971 to 309 and 574 in 1978 and 1980, respectively, just prior to and following the initiation of the one-child measure. Since then, the reported abortion ratio has fluctuated, but has generally risen higher.

These reported ratios probably overstate the ratio of abortions to births. Local planning units are reimbursed for each abortion, giving them a financial incentive for fully reporting each procedure, while births are known to be underreported. Also, the rapid decline in live births over the past 20 years—primarily pregnancies averted through contraceptive use—may have artificially inflated the ratio. Clearly abortion was not responsible for the entire drop in births. Nevertheless, the one-child policy is associated with a substantial jump in the number of abortions. Abortion incidence in China was running about 4 to 5 million a year between 1971 and 1978. The number exceeded 9.5 million in 1980 and 10 million in all but two years during the 1980s.

In reality, the lion's share of the responsibility for birth control rests with women in China, as it does elsewhere.

Induced abortions had already exceeded 7.9 million in 1979, as the one-child measure was going into effect. In the same year, 13.5 million IUD insertions and nearly 7 million female and male sterilizations occurred. Viewing the contraceptive use and abortion figures together reveals both the scale and the nature of population planning activities. It also facilitates an assessment of the role of abortion in China's population planning effort.

Population planning programs averted an estimated 56 million births between 1970 and 1979. During the same decade, approximately 47 million abortions took place. Because a woman can have more than one pregnancy aborted in the time it takes to carry a pregnancy to term, each abortion does not prevent one birth. After allowing for such repeat abortions, the 47 million abortions may have averted about 19 million live births, or 34 percent of the official estimate of births averted during the 1970s.[23]

The all-time high number of abortions occurred in 1983 when the proportion of men and women age 20 to 29 in the population also reached a peak, rising to nearly 17 percent of the total population from about 13 percent in the mid-1970s. This increase in the number of persons of marriageable age, together with lowered age requirements for marriage, appears to have increased abortion incidence independent of the stricter population planning efforts because an increase in the number of newly married couples leads to more first births.

Table 2

Abortion Ratios by Province, China, 1989

Province	Abortion Ratio*
Total	632
Northeast	
Heilongjiang	326
Jilin	265
Liaoning	181
North	
Hebei	860
Shanxi	387
Beijing	436
Tianjin	440
Shandong	756
Henan	954
East	
Anhui	363
Jiangsu	591
Shanghai	2,022
Zhejiang	619
Central	
Hubei	597
Hunan	609
Jiangxi	669
South	
Fujian	728
Guangdong	771
Guangxi	1,130
Hainan	736
Southwest	
Guizhou	537
Sichuan	590
Yunnan	680
Northwest	
Nei Monggol	392
Shaanxi	455
Ningxia	290
Gansu	290
Qinghai	360
Xinjiang	402

* Abortions per 1,000 live births

Note: Abortion ratios may have been affected by underreporting of births or abortions at the local level.

Source: Calculated from China, *Population Planning Yearbook, 1990* (Beijing: National Family Planning Commission), p. 386, 402.

Abortion incidence has never been uniform across the country. The range of variation can be discerned from the first set of detailed statistics (see Table 2) released by the National Family Planning Commission at the end of 1990, which covers all the provinces except Xizang (Tibet).

Lower abortion ratios prevailed in the inland provinces compared with the wealthier coastal provinces. Some inland provinces include large concentrations of minorities who have been exempt from the more stringent population planning measures. With a few exceptions, abortion ratios were higher in the better-off cities and towns than in rural areas.

Increased abortion incidence has been cited by critics outside the country as justification for ending international population assistance to China. Opposition to abortion as well as to other contraceptive methods has a long history. However, relative to the past, planned parenthood now carries little if any moral or ethical stigma in most of the modern world. Induced abortion played a major role in slowing population growth in many developed and developing nations, including Japan and South Korea. Of course, Japanese and Korean women could all have undergone the procedure voluntarily. In China, on the other hand, many millions of abortions occurred under the watchful eyes of population planning personnel. The scope and thrust of China's population planning effort thus has provoked the charge of "coercive planned parenthood."

Gender Preference

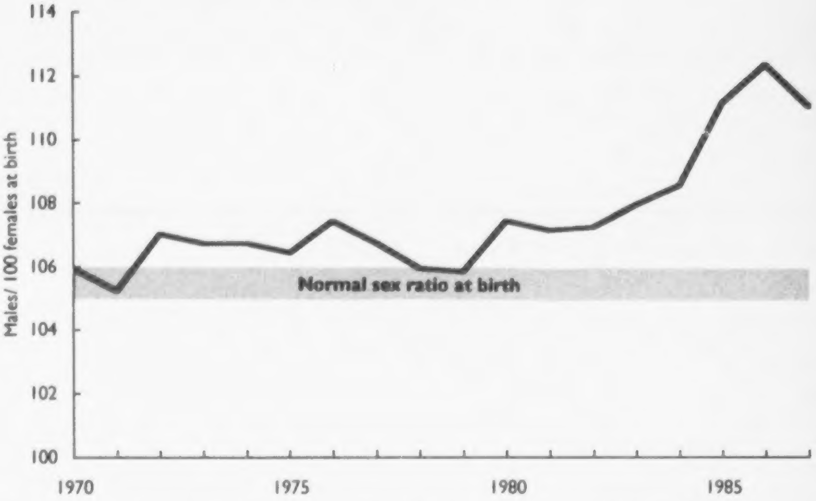
A society's population portrait and an individual's demographic behavior may be analyzed in terms of mortality, fertility, migration, or marriage. These phenomena reflect life events that are intertwined: changes in any one affect the others and vice versa. When radical changes in these variables are induced under less rapidly changing socioeconomic circumstances, they impinge on traditional behavior and customs, inspiring the individual to resist or circumvent the new rules.

In China's case, lower mortality, the continuation of labor-intensive agriculture, the stringent restraints on residential mobility, and the sanctions to promote minimal fertility created unanticipated repercussions and new controversies.

High sex ratios at birth in China during the 1980s are a case in point. Interest in this matter grew out of the disclosures of female infanticides and a flow of stern official condemnations of the practice in the Chinese mass media. Precise figures, whether impossible to obtain or deliberately withheld, have never been provided in Chinese sources. The absence of data ignited instant curiosity, particularly in foreign circles. Discussions of the impact of the one-child policy drew further attention to the matter because of the known preference for male offspring among Chinese couples.

The 1982 census shed no light on the matter. It predated the time when female infanticide was allegedly on the rise. To ascertain the incidence of female infanticide, analysts sought indirect evidence by examining available data on sex ratios. In nearly all populations, 105 to 106 male babies are born for each 100 female babies. The presumption is that most, if not all, deviations above this level in China could indicate excess female mortality—whether from overt infanticide or the abandonment of female babies—or simply the failure of parents to report female births.

Figure 5
Sex Ratios at Birth, 1970-1987



Source: Sten Johansson and Ola Nygren, "The Missing Girls of China: A New Demographic Account," *Population and Development Review* 17, no. 1 (March 1991): 39.

The sex ratios among live births in China during the 1980s, reconstructed on the basis of two nationwide fertility surveys, show a clear increase in the proportion of male babies (see Figure 5). Although fertility surveys, which ask women to remember the gender and timing of each birth, are subject to misreporting, the fact that the two different surveys produced similar results give credence to claims that girls have been "disappearing" from the reported births. The high sex ratio among live births during the 1980s is undoubtedly related to the government's population policy. Sex ratios for babies born to couples complying with local birth plans were in the normal range, while those born outside the plans were as high as 115 to 118 in the years after 1983.[24] This indirect evidence implies that more boys than normal were reported; or, to put it negatively, as many as 500,000 girls were "missing" on the average each year from 1985 through 1987.

Because some 22 to 23 million births occur annually, the exclusion of a half-million female births matters only slightly as far as the birth rate is concerned. It matters a great deal if, in light of prior allegations, the missing girls were victims of female infanticide.[25]

There may be other plausible explanations of the high sex ratios. Given the preference for male offspring and the one-child policy, some analysts have suspected that expectant mothers could be aborting their pregnancies if they knew that the fetus was female. But gender-specific abortion is illegal, and it is unlikely that medical technology for diagnosing the gender of a fetus was ever available enough in China to have caused the great leap upward in sex ratios among live births.

Another explanation for the missing girls is that the births of girls are grossly underreported, especially those of girls given away in adoptions. Underreporting may be an outright failure to report the birth of a girl or to report it as a stillbirth prior to private adoption arrangements.

Adoptions rose sharply in the 1980s. There were over 500,000 cases in 1987 and about 400,000 per year between 1984 and 1986, compared with fewer than 200,000 before the one-child policy. The extremely low sex ratios of 27 to 36 boys per 100 girls among the adopted children are not surprising; parents traditionally are more likely to give away girls, a practice that intensified under the one-child stipulation. When the adopted children by year of adoption are added to their respective cohort of births, the sex ratio at birth comes closer to normal for the years in question. This reduces the number of missing girls by half.[26]

A significant number of unreported female babies may remain with their parents, but are never reported to the authorities. There is no direct way to determine the number of such concealed girls. The 1990 census did not reveal the whereabouts of the missing girls. It did confirm the high sex ratio among children born in the 1980s, particularly in rural areas. In urban areas, the sex ratios among children born between 1985 and 1989 were 109 for those age one or under and 107 to 108 for those ages two to four. In the rural areas, the sex ratios were 112 for ages one and under and 109 to 110 for children two to four.[27]

Another possible explanation of the skewed sex ratios is that more girls die in infancy simply because of traditional gender discrimination. Data from a large number of developed countries as well as from developing countries without strong sex preferences indicate that the internationally "normal" sex ratio among infant deaths is 130.[28] The sex ratios among infant deaths in China, as reported by women in the 1988 survey, fell consistently below 130. The average was 114 for the 1980s. This low ratio suggests that girls receive less care and attention than boys in many Chinese homes, reducing the chance of survival of girls beyond their first

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Girls often receive fewer family resources than boys.

birthday. More important, this gender discrimination affects girls most adversely in the poorest areas.

Sex ratios among infant deaths in China continue to be far below the 130 mark, underscoring the excess female mortality among reported births. For 1989, according to the 1990 census returns, the ratio was 100.3, and it was only 96.3 among infants who died during the first months of 1990.[29]

This phenomenon is not new. Sex ratios among infants, as reported by women in the 1988 survey, were slightly above normal during the 1960s and 1970s before the one-child policy was in effect.[30] Traditional norms and behavior die hard in many parts of present-day China, particularly in the countryside.

The one-child policy may or may not have intensified the traditional neglect of infant girls or prompted infanticide, but the higher than expected sex ratios at birth should not be linked to overt female infanticide without more direct evidence.

Whether the mystery of the missing girls is explained by underreporting of births, concealment of girls, or infanticide—or some combination of these factors—the greater vigilance, stricter surveillance, and tougher administrative supervision that some Chinese have called for[31] cannot remove the forces that drove couples to evasive behavior. The hard fact is: The lesser value placed on girls and the extent to which this guides the behavior of families caught in a perilous village existence are part of China's socioeconomic and demographic realities.

Marriage

The fluctuation in the age at first marriage is another case in which the imposition of policies that go against tradition have yielded some unexpected results. Marriage has always been early and universal in China, although the age at first marriage increased after the founding of the People's Republic. China's first marriage law was enacted in 1950, raising the marriage age to 18 for women and 20 for men from ages 16 and 18, respectively, in pre-1949 years. The law's intent was to counter the pernicious effects of early marriage arranged by relatives when children were in their early teens, or even younger. The early fertility limitation script of the 1950s made no reference to late marriage as a means of family limitation, perhaps because of its neo-Malthusian overtones. The link between later marriage and lower fertility was officially sanctioned during the short-lived upsurge in birth control activities in 1956 and 1957. It was justified because of its positive impact on maternal and infant health and on the physical well-being, education, and work experience of young people.

Subsequently, *wan*—later marriage—became the first component of China's SDI. Women and men were encouraged to marry after their 23rd and 25th birthdays, respectively. By the late 1970s, provincial, municipal, and local regulations further raised marriage ages: to 25 and 27, respectively, for women and men in the cities; and to ages 23 and 25 in rural areas.

The "late marriage rate"—the percentage of marriages in a calendar year occurring to individuals older than the minimum ages cited above—eventually emerged as a performance measure of local population planning units. During 1977-1980, various localities claimed that 75 to over 95 percent of the marriages in their jurisdictions were in the *wan* category. Among women, 88 percent of all marriages in 1980 were late marriages.[32] The higher marriage age probably did slow China's population growth, and may have averted an estimated 100 million births between 1950 and 1980.[33]

Amid the reported gains in late marriages, China amended the national marriage law in 1980, setting the minimum age for marriage at only 20 for women and 22 for men. The lax requirements of the 1980 marriage law came as a surprise in light of the reported popularity of late marriage. In practice, many couples had been

Sex ratios among infant deaths in China continue to be far below the 130 mark, underscoring the excess female mortality among reported births.

marrying informally at younger ages. In relaxing age limits in the 1980 law, policymakers may have been trying to encourage more couples to marry legally by making the age limits more realistic.

Shortly thereafter, reports of a revival of early marriage created an uproar among population planning officials and in population journals. Many of those who sounded the alarm quickly blamed the less stringent minimum age requirements for marriage in the 1980 law. They also cited the harmful effects of other influences, such as remnant feudal-traditional ideologies, bourgeois liberalization, and the earlier physical maturation and socialization of youths in the midst of the "poisonous elements" of western civilization that rushed in as China opened up to the outside world in the 1980s.[34]

The so-called "early marriage" rate refers to the proportion of women who marry before their 20th birthday. This usage, while simple and convenient in policy evaluation and appraisal, ignores the vital differences between the current situation and the early marriages of the pre-1949 era. More importantly, it overlooks the customary age difference between brides and grooms, and the "marriage squeeze" phenomenon.

In all societies, age defines an individual's marriageability in the most basic way. Whether a spouse is arranged or freely chosen, the groom is generally two to three years older than the bride. An imbalance in the ratio of males to females in the prime marrying ages is often referred to as a marriage squeeze. Such an imbalance is usually caused by sharp fluctuations in birth rates—though it may have other causes, such as the heavy migration of one sex into or out of an area, or by war casualties.

Two sharp declines in the birth rate occurred in China: The first resulted from policy errors and famine experienced during the Great Leap Forward, between 1959 and 1961, and the second occurred as the population planning campaigns intensified, between 1975 and 1977. The fall in births during these years exerted a lasting impact on China's age structure, as shown by the indentations in the age pyramid depicted in Figure 6.

Young men born in China from 1956 to 1958, just before the first birth-rate dive, would normally have married women in the 1959-1961 cohort, about

Table 3

Sex Ratios of Men and Women Born 1955-1965, China and Selected Places

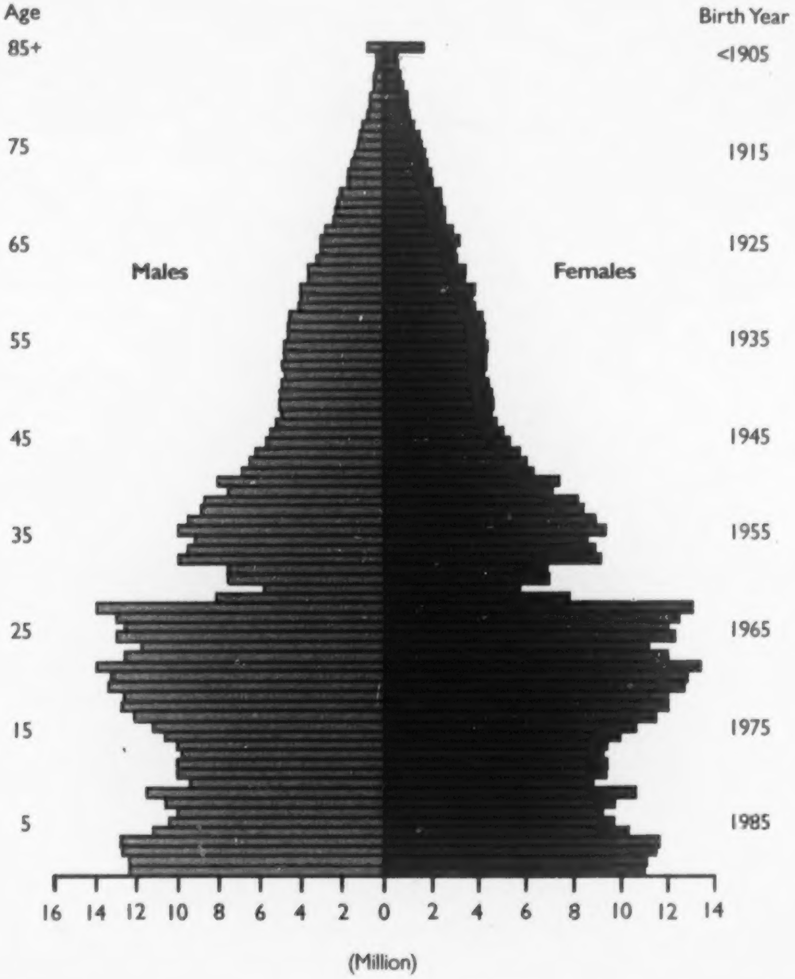
Age in 1982	Year of birth	Population (millions)		Sex ratio[a] (China)	Relative sex ratio[b]				
		Males	Females		China	Shaanxi	Guangdong	Qinghai	Xingling, Hunan
17	1965	–	11.9	–	65	78	113	62	57
18	1964	–	12.4	–	43	63	84	35	28
19	1963	–	13.7	–	53	71	52	47	44
20	1962	7.7	7.9	97	94	100	58	80	85
21	1961	5.3	5.4	99	189	140	89	199	267
22	1960	7.3	7.0	105	140	108	174	148	164
23	1959	7.4	6.9	107	134	109	133	140	147
24	1958	10.1	9.3	109	109	103	108	111	104
25	1957	9.8	9.1	108	–	–	–	–	–
26	1956	9.2	–	–	–	–	–	–	–
27	1955	10.2	–	–	–	–	–	–	–

[a] Males per 100 females of the same age

[b] Males per 100 females with males three years older than females.

Source: Calculated from the 1982 Census.

Figure 6
China's Population by Age and Sex, 1990



Source: *Ten-Percent Sampling Tabulation of the 1990 Population Census of China* (Beijing: China Statistical Publishing House, 1991), Table 4-1.

three years younger than themselves, but they far outnumbered the women born during these years (see Table 3). The ratios of the 1956-1958 cohort men to the 1959-1961 cohort women reached 134 to 189 in the nation as a whole; and were much higher in some provincial and local areas. Large discrepancies of this sort occurred throughout China because the birth rate from 1959 to 1961 amounted to at most two-thirds of the rate three years earlier, 1956 to 1958.

When the 1956-1958 cohort of men reached marriage age in 1982 to 1986, they faced a marriage squeeze that was particularly intense at the local level. The Household Registration System constrained their geographic mobility, further limiting their search for mates of appropriate ages. Many single men may have found a way out of this quandary by marrying much younger women, lowering the average marriage age for women and precipitating the early marriage outcry.

By 1982 to 1984, the proportions of women who married before 20 years of age ranged from 24 to 27 percent in the cities and 31 to 36 percent in the rural areas.[35] In contrast, the percentage of early marriages were 20 or below in cities and 27 or below in rural areas during the late 1970s. But lower rates resumed after 1985, suggesting that early marriage was a transient phenomena, not the harbinger of a return to the tradition of early matrimony.

Given the marked fertility drops during the second half of the 1970s, another marriage squeeze is likely to occur in or shortly before 1996, affecting men born in the early 1970s, as depicted by the uneven age distribution in Figure 6. Because fertility fell much farther and faster in urban areas, city and town residents will probably be most affected.[36] Demanding that these late-marrying men postpone marriage beyond age 25 is not a viable solution; neither is the prohibition of early marriages among women. A more productive step would be to encourage the practice of contraception at the early stage of marriage.

Population Aging

China's rapid transition to low fertility and mortality has created another kind of age imbalance, an increase in the proportion of elderly. Elderly Chinese, like infants and young adults, also have come into the limelight in the aftermath of China's rapid mortality and fertility transitions. Attention to the elderly leapt to new heights almost as soon as the one-child-per-couple policy went into effect. The concern immediately gained graphic representation: A young couple is sandwiched between four aged parents and one young offspring, creating a 4-2-1 population pyramid.

The possible emergence of such an abnormal age structure was a hot topic among population specialists and others in China. Numerous population projections appeared and were used as evidence in the course of the debate. The various series of the projections, interestingly enough, yielded nearly identical numbers of persons age 65 and over for any given year in the foreseeable future. This reflects the general view that, with mortality already at low levels, further drops are unlikely to occur and that the size of the elderly

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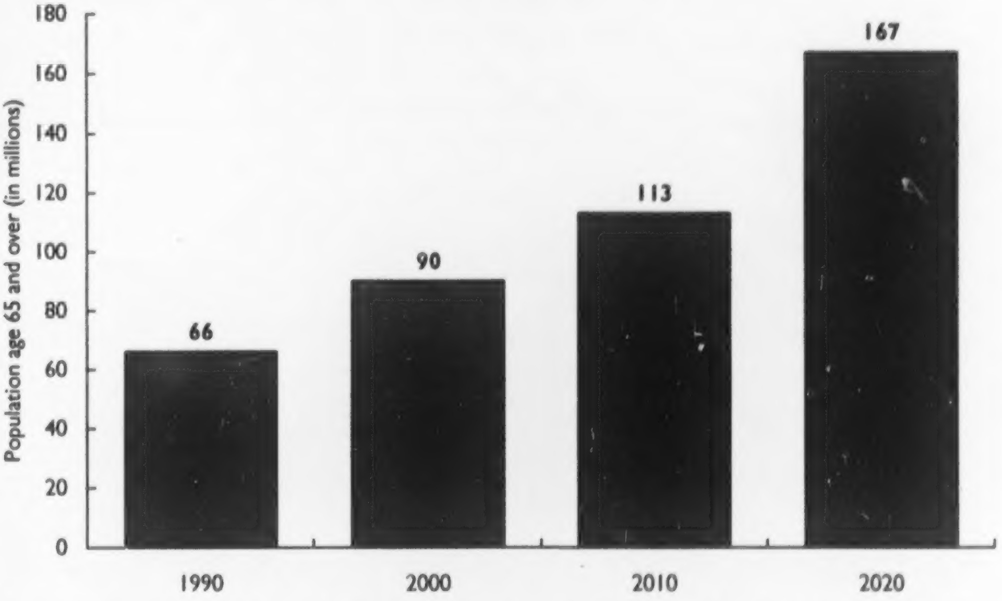
About 7 percent of Chinese—90 million persons—will be over age 65 by 2000.

Figure 7
Population Age 65 and Older in China, 1990-2020



Source: United Nations, *The Sex and Age Distribution of Populations, the 1990 Revision* (New York: UN, 1991), pp. 132-133.

population can be projected with a fair degree of certainty. Future fertility, therefore, will have a greater influence than mortality on population aging in China.

However, the Chinese population is not yet "aged." By international standards, a population is aged when persons age 65 or older account for more than 7 percent of the total population. Such individuals amounted to only 4.9 percent of the Chinese population in 1982. The 1990 census placed their share at 5.9 percent. Barring unforeseen changes in fertility and mortality, at least 7 percent of the Chinese population will be 65 years of age or older in the year 2000, placing China in the "aged" category.

The aging issue is of current importance because of the huge numbers involved. In 1980, the population age 65 and older totaled almost 50 million persons. Their numbers increased to about 66 million in 1990 (see Figure 7), a figure close to the combined populations of the four largest U.S. states: California, New York, Texas, and Florida. The projected annual additions to the 65 and older population will amount to 4.5 million persons between 2010 and 2030.[37]

Population aging—along with the introduction of the pension system—has swelled the ranks of the retired. In urban China, their numbers jumped to 21.2 million in 1988 from 1 million in 1964. The annual average net gain amounted to 1.6 million during the 1980s, and will reach 1.8 million during the 1990s.

Most urban retirees are covered by a pension system. On the other hand, the majority of persons age 65 and older (50 million or more) live in rural areas and still lack any old-age security protection. The most recent data indicate that only some 3.9 million individuals qualify for benefits under village-run five-guarantee schemes (that is, guaranteeing grain, fabric, medicine, old-age care, and burial). The bulk of China's elderly in the villages are actually or potentially the wards of individuals, principally their own adult children. The very real value of children as providers of old-age security is part of the socioeconomic reality that limits China's SDI.

China's Minority Populations

China's ethnic minority populations are another sociopolitical reality that has constrained the population planning policies. Among the first batch of hand-tabulated figures of the Fourth Census released in October 1990 were the number and proportion of minority nationalities. This speedy release was no coincidence. The size and growth of the country's 55 ethnic minorities have long been a top concern among China's policymakers, population planning officials, and demographers. This concern has recently intensified because of both internal and international developments.

The 1990 census placed the population of ethnic minorities at 91.2 million. Although this is only 9 percent of the total population, minorities had increased by nearly 24 million, a relative surge of 36 percent, since the 1982 census. During these eight years, the Han majority grew by 11 percent, less than one-third of the rate of increase among the ethnic minorities (see Table 4).

This surge has poured fuel on the on-going debate among population planning officials and others. Specifically, should some ethnic minorities continue to be exempt from the nation's comprehensive measures for curbing fertility?

Table 4

Principal Population Figures for China, 1990 and 1982 Censuses

	1990	1982
Total Population	**1,133,682,501**	**1,008,175,288**
Han	1,042,482,187	940,880,121
Minority	91,200,314	67,295,167
Sex ratio (males/100 females)	106.6	106.3
Persons per household	3.96	4.41
Percent urban	26.2	20.6
Percent illiterate/semiliterate	15.9	22.8
Educational attainment (% who have attended):		
University	1.4	0.6
Middle school	8.0	6.8
Jr. middle school	23.3	17.9
Elementary	37.1	35.2

Source: China's Fourth National Census, Release No. 1, 1990.

When China's population planning effort intensified in the 1970s, all minority nationalities were exempt from it. Not only was this good ethnic politics, it also recognized the relatively high mortality and comparatively low level of economic development among minority groups. Gradually, however, fertility limitation was promoted in areas with a heavy concentration of minority populations in the late 1980s, such as Nei Monggol (Inner Mongolia) and Xinjiang. These moves were prompted by the 1982 census results that reported a minority population increase of 68 percent since the 1964 census.

By the time of the 1990 census returns, administrative measures of fertility control had already been introduced in all areas of ethnic concentrations except Xizang (Tibet). In no case, however, have the efforts been as intense as the one-child policy directed at the Han Chinese majority. The measures currently in force in different localities stipulate that the majority of the ethnic minorities can have two children, but that nomads and peasants in specific minority areas can have three children. Only under certain very special circumstances can minorities have four children.

Except for the Korean and Manchu minorities, the TFRs of all ethnic minorities were above three, and, in some cases, above five, according to the 1982 census. Some sample surveys of the mid-1980s suggested that these TFRs may be on their way down, but 1990 census data confirm that minority fertility is still very high. Nearly 16 percent of births among ethnic minorities were fourth or higher parity births in 1989, compared with only 6 percent of births among the Han majority.[38]

Higher fertility, coupled with reduced mortality, explains the surge in ethnic minority populations during the recent past. However, other forces have directly and indirectly exerted strong influence in recent times. The adoption in 1981 of *Guidelines for Restoring or Amending Ethnic Minority Status* opened the way for many to claim or reclaim minority status. Reclassification or self-reidentification swelled the ranks of many ethnic populations, particularly those of less numerous groups. Other administrative procedures and preferential treatment affecting the minority nationalities in labor recruitment, school admission, and work assignment encouraged many people to identify themselves as members of a minority.

Exemption of minorities from the one-child-per-couple limit also encouraged people to claim or reclaim non-Han ethnic heritage. The vast majority of children from inter-ethnic marriages have, on their own or on parental advice, reported themselves as minorities. Consequently, the Manchu population increased to 9.8 million in 1990 from 4.3 million in 1982, despite their low fertility. This extraordinary surge denoted an average rate of growth of 16 percent per annum, the highest among all ethnic minorities. During the same period, the Tujia group grew at an annual rate of more than 12 percent, leaping to 5.7 million in 1990 from 2.8 million in 1982.

High natural increase and broadened claims to minority status explain the massive increase in the latest census count of the minority populations. Eighteen of China's 55 ethnic minorities exceeded one million each in 1990, compared with 10 in 1964 (see Table 5). The Zhuang are the largest minority group, numbering 15.5 million, followed by the Manchu (9.8 million) and the predominately Moslem Hui (8.6 million). Other numerically significant groups are the Miao (7.4 million), the Uighurs (7.2 million), the Yi (6.6 million), and the Mongolians (4.8 million).

Table 5

China's Ethnic Minority Groups, 1964, 1982, and 1990

	Number (in 1,000s)			Percent increase
Ethnic group	1964	1982	1990	1982-1990
Total China	**694,582**	**1,008,175**	**1,133,682**	**12**
Total minority	**45,040**	**67,295**	**91,200**	**36**
Mongolian	1,973	3,417	4,807	41
Hui (Moslem)	4,489	7,227	8,603	19
Tibetan	2,505	3,874	4,593	19
Uighur	4,000	5,963	7,214	21
Miao	2,789	5,036	7,398	47
Yi	3,389	5,457	6,572	21
Zhuang	8,403	13,388	15,490	16
Buyi	1,352	2,123	2,545	20
Korean	1,349	1,766	1,921	9
Manchu	2,701	4,304	9,821	128
Tong	838	1,426	2,514	76
Yao	858	1,404	2,134	51
Bai	710	1,132	1,595	41
Tujia	525	2,835	5,704	101
Hani	630	1,059	1,254	18
Kazak	492	908	1,112	23
Thai	536	841	1,025	22
Li	440	818	1,110	25
Other*	7,044	3,436	5,035	-17
Undetermined	17	881	753	–

* Other ethnic groups include Lisu, Va, She, Gaoshan, Lahu, Shui, Dongxing, Naixi, Jingpo, Kirgiz, Tu, Daur, Mulam, Qiang, Pulang, Salar, Maonan, Gelo, Xibe, Achang, Tajik, Pumi, Nu, Eluosi, Ewenki, Benglong, Bonan, Yugur, Jing, Tatar, Drung, and Orogen.

Source: China, *1982 Population Census of China* (Beijing: Statistical Publishing House, 1985); and China Population Information and Research Center, *China's 4th National Population Census Data Sheet* (Beijing, 1991).

The minority nationalities have political and economic significance disproportionate to their numbers. The larger groups are concentrated in the strategically sensitive border areas. Recognition of their geographic concentration and of religious, cultural, and other differences, led to the establishment of the five autonomous regions of Xinjiang (62 percent minority), Nei Monggol (19 percent minority), Ningxia (33 percent minority), Xizang (96 percent minority), and Guangxi (39 percent minority), and of numerous autonomous prefectures and counties in the northwest, north, northeast, and southwest. These lie adjacent to Vietnam, India, Pakistan, Afghanistan, and Myanmar, or, more importantly, share extended borders with various republics of common religious and ethnic heritage now independent from Moscow.

Release of the 1990 census returns on the ethnic minorities helped sharpen the debate over whether to intensify population planning efforts among the ethnic minorities. The imperative of fertility reduction was accepted by the participants at a national conference on China's ethnic minorities held in Beijing in October 1991. However, conference participants were divided on how best to realize it: whether through stronger administrative measures, or through greater socioeconomic development and education in the areas of ethnic concentrations.

The issue has not been resolved. Preparations are now under way to hold a conference in late 1992 to address population planning work among the ethnic minorities. Because of the concern for "political stability, social tranquility, and national unity," it is highly unlikely that the current policy of allowing more than one, two or even three births among the ethnic minorities will be changed. The head of the National Family Planning Commission, Peng Peiyun, recently stated that "under the current international and internal circumstances, stability in policy must be maintained; there must be neither tightening nor loosening up."[39] China's ethnic minority populations are sure to increase in number and proportion for the foreseeable future.

It is highly unlikely that the current policy of allowing more than one, two or even three births among the ethnic minorities will be changed.

Population and Development

China's rapid transition to low fertility in the 1970s occurred in the relative absence of economic development. No one can know how events would have unfolded if population growth had continued unabated, or conversely, if the fertility drops had occurred earlier. Although China achieved considerable economic success in the 1980s despite its large population size, demographic factors were also at work. The effects of the growing population and changing age structure are evident in the surging urbanization, the size and quality of the labor force, the functioning of the health care system, and the expansion of the economy. The magnitude of future population growth will place continuing stress on these and other facets of Chinese life.

Surging Urbanization

While population size and growth have been the primary concern of policymakers, surging urbanization and population redistribution are close behind. In the context of China's economic development and modernization, the effects of population redistribution operate on two dimensions. Redistribution encompasses not only rural-to-urban migration, but also the outpouring of people from the agricultural sector into the industrial and service sectors. This process has involved far-reaching changes in where people live and what jobs they hold.

Urbanization would seem a simple measure of development and modernization. In China, however, the criteria used to define an urban area have been in flux in recent years for political more than scientific reasons. Driven by the notion that higher urbanization denoted a higher level of development and, hence, greater prestige, government officials reclassified numerous areas from rural to urban in the early 1980s. This action instantly pushed the level of urbanization above the 50 percent mark.

The 1990 census followed two procedures in identifying urban population. By one procedure, it reported 601.3 million persons residing in administratively defined cities and towns. On this basis, more than 53 percent of the population would be termed urban, an increase of 394.7 million since the 1982 census. But most of this increase resulted from the administrative upgrading of numerous areas from rural to urban designations.

The upgrading, which occurred mostly after 1984, followed less rigid criteria for establishing *shi* (municipalities) and *zhen* (towns). Including Beijing, Tianjin, and Shanghai—the three municipalities under the direct

Table 6

Provincial Population Data, 1990

	1990 Population[a] (millions)	% increase since 1982	1989-1990 TFR	No. of cities	Percent urban	Non-permanent residents[b]	Density[c] 1990
Total	**1,134.2**	**12.5**	**2.3**	**456**	**26.2**	**27**	**118**
Northeast							
Heilongjiang	35.2	7.8	1.8	29	47.2	55	78
Jilin	24.7	9.3	1.8	21	42.7	33	132
Lianoning	39.5	10.5	1.6	20	50.9	29	270
North							
Hebei	61.1	15.2	2.5	22	19.1	17	325
Shanxi	28.8	13.7	2.5	13	28.7	36	184
Beijing	10.8	17.2	1.6	1	73.1	59	644
Tianjin	8.8	13.2	1.8	1	68.6	27	777
Shandong	84.4	13.4	2.2	32	27.3	18	539
Henan	85.5	14.9	3.0	25	15.5	18	572
East							
Anhui	56.2	13.1	2.6	18	17.9	20	404
Jiangsu	67.1	10.8	2.1	25	21.2	30	654
Shanghai	13.3	12.5	1.5	1	66.2	47	2,118
Zhejiang	41.4	6.6	1.5	24	32.8	26	407
Central							
Hubei	54.0	12.9	2.6	29	28.9	22	290
Hunan	60.6	12.3	2.5	25	18.2	16	286
Jiangxi	37.7	13.6	2.6	15	20.4	24	226
Southeast							
Fujian	30.0	16.1	2.7	14	21.4	47	248
Guangdong	62.8	17.2	2.7	19	36.8	64	353
Guangxi	42.2	16.0	2.8	12	15.1	20	178
Hainan	6.6	15.7	2.9	3	24.1	44	193
Southwest							
Guizhou	32.4	13.4	3.2	8	18.9	20	184
Sichuan	107.2	7.5	1.9	23	20.2	16	188
Yunnan	37.0	13.6	2.8	11	14.7	16	94
Xizang (Tibet)	2.2	16.0	4.5	2	12.6	33	2
Northwest							
Nei Monggol	21.5	11.3	2.1	16	36.1	45	18
Shaanxi	32.9	13.8	2.8	11	21.5	22	160
Ningxia	4.7	19.5	2.8	4	25.7	28	90
Gansu	22.4	14.3	2.4	13	22.0	19	49
Qinghai	4.5	14.4	2.6	3	27.3	56	6
Xinjiang	15.2	15.9	3.4	16	31.9	48	9

[a] Population totals do not include in-migrants without official clearance and 3.2 million persons serving in the armed forces.

[b] per 1,000 residents

[c] persons per square kilometer

Sources: China Population Information and Research Center, *China's 4th National Population Census Data Sheet* (Beijing: 1991); and United Nations, "Accessibility of Contraceptives," *Asian Population Studies Series*, no. 103B (Bangkok: UN, 1991), Table 1.

jurisdiction of the central government—there are now 456 municipalities, or cities (see Table 6), and 9,322 towns, compared with 236 municipalities and 2,664 towns counted in the 1982 census.

Using a second set of criteria, the National Census Office placed the total population of cities and towns in the 30 provinces, autonomous regions, and municipalities at 296.5 million. This lower figure excludes city and town residents outside the jurisdiction of their administratively established districts and street or neighborhood committees (wards). By this calculation, 26 percent of China's population lived in urban areas in 1990. This figure, according to the census officials, "objectively reflected the present level of urbanization in China."[40]

The second calculation indicated a much smaller, but still substantial, increase of nearly 90 million in the urban population in the eight years since the 1982 census. The extent to which this rise resulted from administrative upgrading of areas cannot yet be calculated.

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In-migration contributed most to Shanghai's growth in the 1980s.

Using either definition, China experienced a striking increase in urbanization over the past decade, raising the concern of policymakers. The current urban situation differs considerably from that of 1949 to 1979, the first three decades of the People's Republic. During that period, only a little over one-third of the increase in urban population was due to migration from rural areas; nearly two-thirds of the growth stemmed from natural increase within the urban population itself.[41] The eight-year intercensal period between 1982 and 1990, in contrast, registered not only greater absolute gains in urban population, but also greater contributions from in-migration.

Aside from the impact of administrative reclassification, the surge reflected the mounting population movement following the decollectivization of agriculture and economic deregulation across the country after 1978. Population gains in China's two leading metropolises demonstrate the effects of these reforms.

Beijing, the capital, reported a 17 percent increase in population, and Shanghai, a 13 percent rise, between 1982 and 1990. During the same period, the rate of natural increase (births minus deaths) was nearly 8 percent in Beijing and 5 percent in Shanghai. In-migration accounted for the lion's share of the cities' growth.

The volume of internal migration in recent years can only be guessed. One factor that confounds accurate estimation is the resident status of persons based on the Household Registration System (HRS). The HRS, established in the late 1950s, has become an integral part of China's two-tier rural-urban socioeconomic system (see Box 1).

Provincial population increases between 1982 and 1990 varied considerably, from a low of 7 percent in Zhejiang to a high of 20 percent in Ningxia. The level of urbanization also varied considerably, from 13 percent in

Box 1

China's Household Registration System

China's household registration system (HRS) was instituted in urban areas in the early 1950s and later expanded to rural areas. The system was originally created to provide a continuous record of births, deaths, migration, marriage, and changes in household composition. Except during the Great Leap Forward (1958-1961) and the Cultural Revolution (1966-1970), the HRS has recorded Chinese population changes every year since its inception. The quality of the data has been sporadic, but they provide the most complete national information available for many of the early years.

The system—under the control the Ministry of Public Security since the mid-1950s—has also become an integral part of China's two-tier rural-urban socioeconomic system. Although the HRS was originally designed as a population register, it has evolved into an powerful bureaucratic mechanism, loaded with administrative, distributive, punitive, and social control functions with ominous ramifications for the individual almost exclusively by reason of birth rather than merit.

For the individual of rural birth, rural residency constitutes a formidable barrier to educational, employment, and marriage opportunities. City residents, in contrast, receive considerable government subsidies in rice, cooking oil, housing, medical care, and transportation, as well as pensions and other entitlement programs. A migrant from the countryside to the city can never qualify for these subsidies no matter how long he lives in an urban area.

Changing the HRS into an authentic population register rather than a means of enforcing policies poses a dilemma for the Chinese government. Freeing rural residents from the constraints of the HRS could unleash a pool of valuable talent. However, although the subsidies to official urban residents are being gradually reduced through price increases and wage adjustments, it is unlikely the government could afford to offer these same benefits to the unofficial urbanites. Also, rapidly scaling back the HRS is likely to accelerate rural-to-urban migration and complicate urban development.

Xizang (Tibet) to 73 percent in Beijing. Because fertility is higher in rural areas all over China, the more rural provinces had slightly higher population growth.

The more urban provinces tended to have more non-permanent residents per 1,000 permanent residents. These non-permanent residents are most likely to be migrants who moved to cities and towns from the countryside. Many may intend to stay but cannot obtain legal resident status.

Because of the many difficulties involved in altering one's resident status under the terms of the HRS, many urban in-migrants simply do not report their presence. The failure to register has been particularly prevalent among those leaving the countryside after agricultural decollectivization and the emergence of the market economy.

The convergence of the various demographic and economic forces consequently has given rise to what Chinese officials and demographers label as "floating population," a catch-all category which includes construction workers, itinerant craftspersons, hawkers of clothing and consumer wares, peddlers of farm produce, and young rural women and men seeking service jobs in private households. No precise estimates of the floating population are available, but authorities have placed

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Urban growth was accompanied by a labor force shift toward industrial employment.

the number at 60 million on an average day.[42] There is yet no way to ascertain the length of their stay, but a huge proportion of them—and their children—may well stay in the cities for good. A recent report showed that at least 33.8 million people migrated from their hometowns to other cities, counties, or towns between 1985 and 1990.[43]

Urbanization has brought little change in China's regional population distribution. Seventy-one percent of the total population in 1990 lived in the 15 provinces (Jilin, Liaoning, Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong, Guangxi, Hainan, Sichuan, Hubei, Hunan, Jiangxi, and Anhui) and 3 municipalities (Beijing, Shanghai, and Tianjin) along the coast and the Yangzi River. This heavy concentration of population in coastal and maritime provinces further accentuates the pattern of past decades, if not centuries. China's newly created economic free zones and special economic zones (SEZ) are all on the coast (see Box 2). Coastal provinces and municipalities account for 305 of the 456 cities of municipal status in 1990.

Jobs and Workers

The surging urbanization of recent years has been accompanied by large shifts in the ways in which people earn a living. As of 1989, 90 percent of workers were engaged in primary or material production (agriculture and industry), 3 percentage points less than in 1978. Correspondingly, 10 percent of workers were employed in non-material production (such as commerce and trade, transportation, and postal- and telecommunications).[44]

Fundamental changes have occurred in China's economy since the start of the 1978 economic reforms. The developments reflect a sizable reduction in agricultural employment, from 71 percent of the work force in 1978 to 60 percent in 1990. Industrial employment, 18 percent in 1978, increased amid the exodus from the agricultural sector, but not at a commensurate pace. Retrenchment or redirection of government investments during the reform years produced ups and downs in industrial employment. In 1990, 22 percent of workers were in industry. In

Box 2

China's Entry Into the Global Economy

The economic reforms introduced in 1978 had far-reaching implications for the countryside, where three-fourths of Chinese live. The restoration of the family as the main unit of agricultural production, the gradual relaxation of price controls, and creation of owner-directed enterprises, have been transforming rural life.

But the major impact of these reforms may lie in the phenomenal economic growth in China's maritime provinces. These areas form a wedge for China's entry into the global economy and provide the most visible signs of modernization. To implement China's "opening to the outside world," economic free zones were established in a growing swath of cities along the coast. In these areas, bureaucratic restrictions were relaxed or eliminated to attract foreign capital. But the strongest incentives for foreign investment—and most impressive growth—have been in the five special economic zones (SEZs) created in South China: Shenzhen, Zhuhai, and Shantou in Guangdong Province, Xiamen in Fujian Province, and Hainan, China's island province.

These South China provinces—which have a combined population of nearly 100 million—were the logical location for these experiments in market economy. They had been the primary actors in international trade before the establishment of the People's Republic; and the people of Guangdong Province have close familial and linguistic ties to the residents of neighboring Hong Kong and Macao.[1] By the time the British Colony of Hong Kong is returned to China in June 1997, the economy of Guangdong will already be integrated with that of Hong Kong.

Guangdong Province has enjoyed the fastest economic growth in East Asia over the past 15 years, comparing well with so-called Asian Tigers such as Hong Kong, South Korea, and Singapore, and Small Tigers such as Thailand. Numerous Asian companies, along with European and U.S. firms such as Peugeot and Proctor and Gamble have been attracted to Guangdong and the SEZs by the low cost and high productivity of the workers and advantageous regulations. Some 2 million Guangdong residents are employed by Hong Kong-owned factories. Industrial output—principally of clothes, shoes, and toys—rose by 15 percent per year in Guangdong during the 1980s. Exports from the province accounted for one-third of China's total exports in 1990.[2] The Hainan and Fujian SEZ have also scored huge economic successes.

Wealth has brought cellular telephones, crowded restaurants, imported consumer goods, and other signs of modern urban life to these once sleepy coastal cities. Guangdong reportedly has the highest standard of living in China. While the economic growth and modernization of this area may have widened the gap between the lives of urban and rural, and inland and coastal, residents, they are probably harbingers of the future. Superhighways, airports, and ports are already under construction—and more are planned—to enable China's coastal regions to catch up with other Asian nations and become Asia's next Small Tiger.

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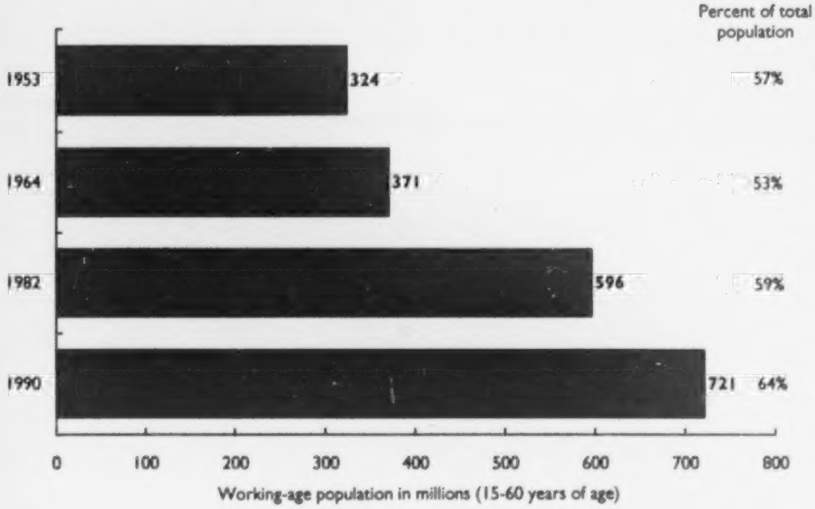
Figure 8

Working-Age Population in China, 1953-1990



Source: *Statistical Yearbook of China* (Beijing: China Statistical Press, 1985), pp. 600-605; and *Ten-Percent Sampling Tabulation of the 1990 Population Census of China* (Beijing: China Statistical Publishing House, 1991), Table 4-1.

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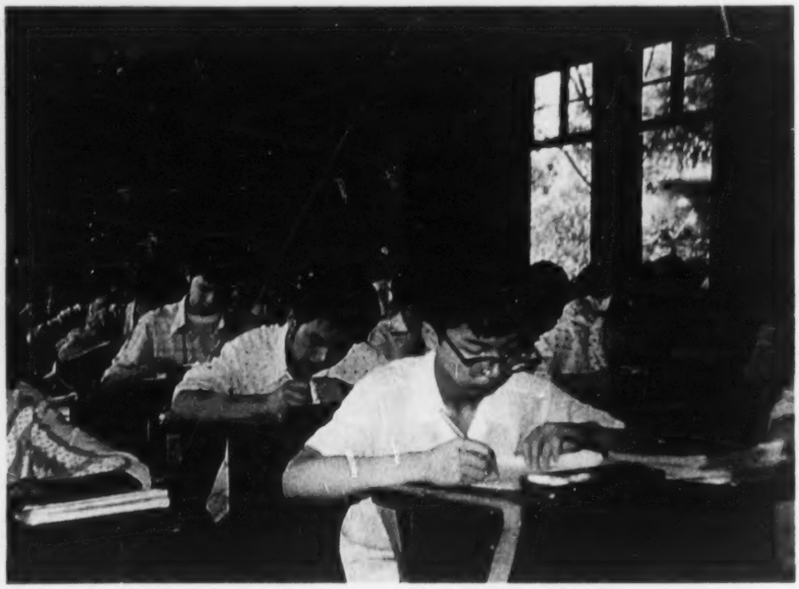


Education has become nearly universal at the primary level.

contrast, employment in the tertiary sector (trade, commerce, construction, and service occupations) increased steadily between 1978 and 1990, growing from 12 to 18 percent of the work force.

The size, growth, and skills of China's work force continue to present serious challenges to the government. The 1990 census placed persons of working age (15-60 years) at 721 million, or 64 percent of the population, registering an intercensal growth of 22 percent since 1982 (see Figure 8). Persons of working age will probably number 770 million by 2000, increasing China's potential labor force by 5 million each year until the end of the century.[45]

China's demographic surges in the 1950s and 1960s have produced a young labor force. The median age of the work force was 31 in 1990. Eighty percent of the working-age men and women were under age 45. The demographic momentum created by the high birth rates of the past continues to increase the working age population. The number of 15-year-olds entering the labor market reached 21.7 million in 1990, more than twice the number (10.1 million) in 1953. The flow of new workers will stay high for quite some time, exceeding the number of available jobs. In 1990, there were an estimated 11 million unemployed in the country—500,000 more than in 1989.[46] However, this probably underestimated the situation because it did not include the invisible unemployed—surplus or idle workers—in offices and factories.[47]

The lack of jobs continues to be serious in large cities. In 1982, while the national unemployment rate was 5.5 percent, the rate reached 8.3 percent in Beijing and 7.7 percent in Shanghai.[48] The number of those "waiting for job assignment"—the euphemism for the unemployed—exceeded 5.8 million in the urban areas, according to the 1990 census. More than 80 percent were 15 to 24 years of age.

In rural areas, the decollectivization of agriculture has revitalized production but rendered superfluous more than 140 million former workers in the communes and production brigades. Another 170 million may become so by the end of the century.[49]

The job situation has a brighter side. Opportunities in trade, commerce, and service occupations have mushroomed following the economic deregulation of recent years. Between 1977 and 1985, nearly 12 million small-scale individual businesses came into existence, employing 18 million people.[50]

Efforts to improve the rural job situation have focused on sideline occupations, low technology industries, and small town developments. By 1985, the number of people employed by various rural enterprises totaled 60 million. It is estimated that rural industries and enterprises will be able to employ 180 million people, or 40 percent of the rural labor force by the year 2000.[51] Whether this will ease the pressure to leave the rural areas for the cities remains to be seen.

The short-term successes in labor force absorption have been encouraging, though far from sweeping. To Chinese officials and labor specialists, the long-term remedies lie in upgrading the skills of the young work force, increasing productivity, and boosting economic development.[52]

Education

The quality of China's growing labor force is a major concern for policymakers. The low educational and skill levels of Chinese workers are a drag on China's aspirations to become a major player in the world economy. While China is attempting to expand educational opportunities throughout the country, the generally low literacy levels of adults and the constantly expanding school-age population are major impediments to achieving an educated work force.

Student enrollment and educational levels have shown remarkable improvements in recent decades. In 1989, some 232 million students were enrolled in schools of all types in China, compared with 203 million in 1975, just prior to China's four modernization decision. The expansion encompassed large increases at the university level and in technical-vocational and adult education. The number of institutions of higher learning increased to 1,079 in 1989 from 675 in 1980. Their enrollment rose by 82 percent to 2.1 million. In 1989, some 5 million students were enrolled in agricultural, vocational, and technical schools; and 37 million were receiving instructions in adult schools of all types (see Table 7).

Education at the primary level has become nearly universal, reaching an estimated 97 percent of children. But only 70 percent of the primary school graduates go on to junior high school and only a little over one-third of these students continue on to senior high school. No more than 2 percent of persons ages 20 to 24 go on to the universities, compared with 5 percent in developing countries in general.[53]

Table 7

Schools and School Enrollment in China, Selected Years, 1975-1989

Level	1975	1980	1985	1989
		Number of schools		
Institutions of higher learning	387	675	1,016	1,079
Secondary schools				
Regular	123,505	118,377	93,221	89,575
Technical	1,326	2,052	2,529	2,940
Vocational	887	1,017	1,028	1,044
Agricultural	na	3,314	8,070	9,173
Primary schools	1,093,317	917,316	832,309	777,244
Kindergartens	171,749	170,419	172,262	172,634
Schools for the blind and deaf	246	292	350	483
		School enrollment (in 1,000s)		
Total enrollment	**203,228**	**216,014**	**217,318**	**232,088**
Institutions of higher learning	501	1,144	1,703	2,082
College new admissions	191	281	619	597
Secondary schools				
Regular	44,661	55,081	47,060	45,540
Technical	405	761	1,013	1,493
Vocational	302	482	558	685
Agricultural	na	454	2,295	2,823
Adult schools[a]	na	na	15,533	36,613
Primary schools	150,941	146,270	133,702	123,731
Kindergartens	6,200	11,508	14,797	18,477
Schools for the blind and deaf	27	33	38	47

[a] Including students in adult institutions of tertiary, secondary, and primary learning.
na: not available
Source: *Statistical Yearbook of China 1990* (Beijing: China Statistical Press, 1990), pp. 703, 706-708.

Budgetary constraints, continuous waves of new students, and the shortage of qualified teachers make further educational expansion unlikely for the foreseeable future. Full-time faculty members in institutions of higher learning doubled between 1981 and 1988, reaching nearly 334,000. Many, if not most, were recent university graduates. Primary and secondary school teachers numbered approximately 9 million in 1988. An estimated 1.8 million additional teachers will be needed to realize China's current plan to universalize education below senior high school.[54]

The educational level of the adult population has improved over the past decade thanks to literacy campaigns and expanded student enrollments since the 1970s, but it remains limited. In 1990, 16 percent of Chinese over age 16 were illiterate or semiliterate (unable to read or write more than a few characters), down from 23 percent in 1982. Two-thirds of these were women. Some 37 percent of adults had at least attended elementary school, but only 8 percent had gone as far as middle school, and only 1.4 percent had attended university. This was only a slight improvement over educational achievement in 1982, as seen in Table 4, page22 .

Table 8

China's Health Care Resources, Selected Years, 1975-1989

	1975	1980	1985	1989
		Medical personnel (in 1,000s)		
Total	2,594	3,535	4,313	4,787
Senior physicians	293	447	602	1,023
Junior physicians	356	444	473	321
Practitioners of Chinese medicine	229	262	336	370
Nurses	380	449	569	512
Other[a]	1,336	1,932	2,333	2,562
		Medical facilities (in 1,000s)		
Hospitals	62	65	60	62
Hospital beds	1,764	2,184	2,487	2,867
Beds/1,000 persons	1.74	2.02	2.14	2.33

[a] Including physicians trained in Chinese and Western medicine, pharmacists, and primary-level health workers.

Source: *Public Health Yearbook of China 1990* (Beijing: People's Health Press) pp. 453-454.

Health Care

Economic reforms, surging urbanization, population growth, and aging have had a fundamental impact on China's health care system. China's expressed goal has been to provide "basic health care for all by the year 2000." The country has already succeeded in expanding both medical personnel and facilities (see Table 8). Improved care and prevention programs have virtually wiped out such diseases as smallpox, cholera, malaria, typhoid, and scarlet fever; have reduced infant mortality to below 40 deaths per 1,000 births; and raised the life expectancy at birth to 67 years. Further reductions in mortality, however, may be thwarted by demographic, economic, and political factors.

China's medical services operate within a three-tier system. At the bottom are the village and township health clinics that provide care for more than 70 percent of the population. Their staffs consist primarily of the 1.2 million "barefoot doctors" (now called country doctors) who are paramedics with extra training in first-aid, hygiene, contraception, and basic preventive medicine. Such clinics exist in about 88 percent of China's 743,000 villages. The number of clinics and country doctors declined in the 1980s because decollectivization of agriculture cut off a major source of funding—the village production brigades. Users fees and contributions by village industries have been insufficient to pay for basic rural health needs. Only 40 to 45 percent of the rural population were covered by an organized cooperative medical system in 1984, compared with 80 to 90 percent in 1979. Because about 80 percent of Chinese births occur in rural areas, this erosion of services could mean lower quality health care for China's next generation.

Some 47,500 township medical health centers, with an average of 15 beds and 18 doctors each, made up the middle tier of China's health care system in 1989. The top tier consisted of

2,200 county hospitals, with an average of 175 beds and 211 formally trained doctors each. These hospitals located in county seats and large cities are the only ones that receive funds from the national government.[55] Urban patients, particularly the 126 million persons enrolled in the system of free medical care for government employees and workers, receive heavily subsidized care from the government.

The cost of medical care for individuals in the public sector and in the state-owned enterprises has skyrocketed, as it has in other countries. Between 1978 and 1990, the cost shot up more than 600 percent, to $4.2 billion. During these same 12 years, China's gross national product only doubled.

The soaring expenditures stem from the rising cost of medicine, wastes and abuses in medical prescriptions, and the growing number of persons entitled to free medical care. China's rapid transition to low mortality satisfied the universal desire for longer lives. However, increased longevity, along with modernization, ushers in the problems associated with population aging, including rising medical costs for society, the family, and the individual.

The Economic Picture

China's demographic changes over the past two decades must be viewed in relation to the drastic economic shifts that occurred during this period. China's gross national product (GNP) increased by leaps and bounds during the 1980s. The total jumped to $427 billion in 1989 from approximately $120 billion in 1980.

Table 9

Selected Economic Indicators for China, 1980 and 1989

	1980	1989	Average annual growth 1980-1989 percent
Total output index[a]			
Agricultural	109	188	6.3
Industrial	119	361	13.2
Consumption index[a]			
Urban residents	117	207	5.1
Rural residents	117	215	7.0
Income per head (net)[b]			
Urban residents	¥439.0	¥1,260.7	–
Rural residents	191.3	601.5	–
Consumption expenditures per head			
Total	–	¥700.0	–
Urban residents	–	1,404.0	–
Rural residents	–	518.0	–

[a] 1978=100 (base year)

[b] ¥1.00 = US$0.18 in 1991

Source: *Family Planning Yearbook 1990* (Beijing: National Family Planning Commission 1990).

China's proclaimed goal for the century's end was to attain *xiaokang shuiping,* or a comfortable living standard, for the nation as a whole. This called for the quadrupling of the country's total industrial-agricultural output between 1981 and 2000. By 1989, the mid-point in the period in question, considerable progress toward that goal was obvious. By that year, all but two of the indices of output and consumption shown in Table 9 were at least double the levels of 1978, the base year for the indices.

Both the GNP and total personal income rose at an annual average rate of more than 9 percent during the 1980s. The industrial sector led all others in expansion, reporting an average growth of more than 13 percent per annum. The agricultural sector also advanced, but at only half the pace. Tertiary employment increased its share of output in the GNP from 16 percent in 1980 to over 22 percent in 1991.[56]

Recent industrial and agricultural gains have already raised living standards. Overall consumption has increased by an annual average of 6.6 percent. The pace of gain among rural-agricultural residents has been a little higher (7 percent) than that among the non-agricultural urban population (5 percent). Life in China is better, and the relative improvement has been slightly greater for those living in rural than in urban areas.

Life in the countryside has benefited from the rapid proliferation of rural non-agricultural enterprises engaged in the processing of agricultural products and in commodities manufacturing. Ministry of Agriculture figures show that their total production nearly doubled between 1978 and 1990, from $91 billion to $180 billion; and a growing percentage of these commodities are sold abroad. Such rural enterprises now employ 22 percent of China's rural work force—nearly 93 million people.[57]

The Chinese people enjoy access to a greater variety of consumer goods. The increases in durable goods alone were remarkable during the 1980 decade (see Table 10). The number of bicycles, which are the equivalent of cars in American households, jumped to 328 from 77 per 1,000 population between 1978 and 1989. Television sets rose from nearly zero to 149 per 1,000 population in one decade. Most impressive, the number of washers and refrigerators soared from absolute zero in 1978 to 78 and 23 per 1,000 population, respectively, by the end of the decade. Other leading consumer goods, such as watches, sewing machines, radios, cameras, and electric fans, also registered substantial gains.

The per capita consumption of rice, pork, beef and lamb, eggs, poultry, seafood, sugar, cooking oils, liquor and wine, cotton and synthetic textiles, and cigarettes all showed either marked or modest increase. The daily average food intake has reached 2,637 calories, according to a United Nations estimate.

Table 10

Availability of Selected Consumer Items, 1978 and 1989

	Per 1,000 population	
Item	1978	1989
Sewing machines	35	122
Watches	85	501
Bicycles	77	328
Electric fans	10	156
Washers	–	78
Refrigerators	–	23
Televisions	3	149
Radios	78	236
Cameras	5	19

Source: *Family Planning Yearbook 1990* (Beijing: National Family Planning Commission, 1990), p. 429.

Indeed, for many in China, the 1980s were a period of rapid economic expansion. Their level of living had already progressed a long way toward *xiaokang shuiping* before the start of the eighth five-year plan in 1991. Another doubling in production may be expected by 2000.

While living standards are improving on the national level, extreme poverty persists in numerous areas throughout China. Inland and remote provinces in western China lag far behind those along the coast in eastern China. As of 1986, almost a third of the country's counties were officially identified as "poverty counties." These 664 counties are located mostly in the mountain and arid plateau regions. The annual per capita income among their residents amounts to only 50 percent of the 1986 national average of $199.00. Nearly 20 percent of the population may be below the poverty level by this definition—or in Chinese terms, still unable to reach the level of *wenbao* (warmth and bare essentials).

There are no precise figures on the number of people hovering just above the poverty line in recent years. Relative poverty probably engulfs additional hundreds of millions of people. Nor are there more recent figures on the number of persons who remain below the line in 1992. The tardiness in releasing poverty data is in sharp contrast to the speed with which China disseminates huge amounts of information whenever gains have occurred in the economy.

Despite persistent poverty and signs of deteriorating health care in rural areas, the lot of China's 1.2 billion population has markedly improved, though the road to *xiaokang shuiping* for all remains long and difficult.

How can the rapid and widespread achievements of the last dozen years be explained? No similar growth occurred during the 1950s and 1960s when the size of the population was only half that of the 1980s. What is the relationship between population size and economic development in this most populous nation on earth?

Most of the recent economic gains have been attributed to policy changes that reduced government control of businesses and industries, increased the importation of foreign technology and capital, and allowed prices to fluctuate with market conditions. However, all these explanations highlight the economic-political variables to the exclusion of China's momentous demographics. This exclusion incites speculation about whether a large and growing population materially obstructs real economic growth.

It could also be argued that had the country's population planning been initiated earlier, in the 1950s and 1960s, the level of economic development would have been higher than it has been. Similarly, had fertility control been in place earlier, the total population would now be smaller and the standard of living would be higher in per capita terms. But these are hypothetical arguments. The population total now is much larger than it would or could have been had China's demographic initiative started earlier. Notwithstanding the tardy start in fertility curbs and the deafening population explosion, the pace and scope of economic growth have demonstrably surged during the 1980s and are moving vigorously ahead in the 1990s.

Environmental Degradation

Rapid demographic growth generates difficulties of all sorts in a poor and backward economy, primarily providing sufficient food, employment, housing, health care, and the like. Besides these issues of daily existence and well-being, as the saying goes, to populate is to devastate. The larger the base population, the more widespread is its environmental impact in terms of reclamation of wastelands, deforestation, or accelerated soil erosion. Additionally, and more importantly, economic development and modernization exert a far more insidious and injurious impact on the environment. For example, urbanization and industrialization—with inadequate sewage and treatment facilities—have already polluted most of China's rivers and produced a serious shortage of drinking water in urban areas. The municipality of Beijing is projected to have a shortfall of 500,000 cubic meters of water daily by 2000, equal to about two-thirds of its current supply. Groundwater levels have already fallen sharply in the region, causing serious land subsidence in some areas of Beijing.[58]

Modernization and population growth have also intensified solid waste disposal problems. Plastic and styrofoam litter the urban landscape and follow the railroad tracks from one end of China to the other.

The larger the base population, the more widespread is its environmental impact.

Population, Development, and Land

The growing population base, land degradation, and industrial expansion have caused a decline in the per capita supply of agricultural land. Recent estimates place arable land in China at about 14 percent of the country's 9.6 million square kilometers. The total area under cultivation amounts to 135 million hectares (one hectare = 2.47 acres), and there remain no more than approximately 500 million *mu* (one acre = 6 *mu*) that may possibly be reclaimed for agricultural purposes. On a per capita basis, cultivated land has dropped to 1.8 *mu* in 1988 from 2.7 *mu* in 1949, even though the overall amount of land under cultivation increased from 1.6 to 2.0 billion *mu* between 1952 and 1988. The supply of arable land per head may drop to 1.6 *mu* or less by the year 2000.

Pasture lands, now situated almost exclusively in northern China, are estimated to cover 310 million hectares. Of these, only two-thirds can be effectively used to raise livestock. Only about one-fifth of the pasture land provides high quality fodder.

FAO/F. Mattioli

On a per capita basis, the amount of arable land in China has declined dramatically.

China's forests also are dwindling. Only 13 percent of China's land was under the cover of foliage in 1989, down from 15 percent in 1974.[59] Moreover, ecological abuses of past millennia, such as "slash and burn" agriculture and denuding woodlands for fuel wood, have turned vast areas into deserts in northern and northwestern China. Land degradation is spreading eastward and southward, robbing the country further of agricultural and pasture lands. Some 120,000 square kilometers of China now are permanent deserts and another 15,800 square kilometers are being menaced by spreading sands.

Although China's finite land resources are threatened by the expanding population and economic development, the stress has been eased by improved agricultural and related output in recent decades. Of course, population growth accelerates demand for residential space and, other things being equal, encroaches on arable land. The growing competition for land for economic development, the continuing urbanization, and population growth accentuate the need for effective land-use management.

Soil degradation in China reflects both natural forces and the errors of past centuries, but it has been accelerated in no small measure by more recent policies. To increase the land available for grain production, various post-1949 measures prompted indiscriminate clearing and cultivation of forests and grasslands. This misunderstanding of the dynamics of the ecosystem was responsible for lasting damage to the soil.

Just as China's policymakers' understanding of demographic trends emerged belatedly, their ecological enlightenment surfaced only in the mid-1970s. Since then an increased appreciation of ecological issues has stimulated efforts to restore forest and pasture lands, to protect existing forests and grasslands against encroachment, and to broaden reforestation efforts.[60] Legislation to formalize these steps emerged in the 1980s, resulting in a comprehensive Environmental Protection Act.

Pollution from Energy Sources

Although there was already heightened ecological concern by the start of the eighth five-year plan in 1991, China's ecological circumstances remain critical. China needs to increase its energy consumption as the population and economy grow, yet China is still heavily dependent upon energy sources that denude forests and pollute the air. The annual consumption of timber as fuel decreased by 8 percent between 1988 and 1990, according to the Ministry of Forest. Nevertheless, because of the shortage of alternative fuels, nearly one-third of China's annual total timber consumption goes up in smoke, used for household cooking and heating. This is the main reason why the timber consumption still outstrips forest growth in one-third of the 30 provinces, municipalities and autonomous regions.

In urban areas, cooking and heating depend on coal and a small amount of natural gas. Although this spares some timber land, air pollution from coal burning has more serious health effects. Air pollution is being compounded by increased use of coal in industry as the country develops economically.

Coal-burning generators account for 80 percent of the electrical power generating capacity. Plans are under way to increase annual coal production (1 billion tons in 1990) by an additional 20.8 million tons and to raise electric generation by another 86.2 million kilowatts. Neither increase will meet China's industrial and civilian needs in the decades ahead. Furthermore, increased coal burning will not only contribute to respiratory and other health problems within China but to depletion of earth's protective ozone layer. China ranks just after the United States, the former Soviet Union, and Europe in the volume of emissions of carbon dioxide from fossil fuels.[61]

Perhaps new technologies or other fuel sources can both satisfy the country's growing industrial and civilian needs and provide cleaner air. The replacement of the existing 6,000 steam locomotives, which consume 15 million tons of coal annually, with diesel engines would reduce emissions but it is a costly and lengthy step. There is no evidence of a substantial increase in China's output of crude oil in the near future. Nuclear power generation is in its infancy in China. The proposed damming of the Three Gorges of the upper Yangzi River to produce electricity, which gained official approval in March 1992, remains controversial. Besides the immediate flooding of valuable arable tracts and the eventual displacement of 1 million or more people, the dam's long-term impact on the adjacent and downstream areas would be substantial and possibly disastrous.

None of the known solutions to China's dependence on coal is risk-free, nor can they furnish more than a token of the energy that is needed. The burning coal will not soon, if ever, be extinguished and air pollution continues to be China's leading environmental hazard.

A systematic, effective, and complete environmental clean-up is an ideal beyond realization at present. In the long run, as the country develops further economically, China may be in a better position to redress the situation and to afford adequate safeguards against environmental hazards. However, few developed nations have effectively tackled pollution problems within their borders. Neither will China's many environmental issues be easily or quickly resolved. Ecological intelligence and management, not unlike the issue of population itself, are matters of politics, economics, and ideology.

A systematic, effective, and complete environmental clean-up is an ideal beyond realization at present.

The Future

Dida, wubo, renduo—"vast territory, abundant materials, and massive populace"—long has epitomized China's circumstances in the minds of many. *Renduo* bears the double message of achievement and apprehension. China's demographic affluence, as the saying explicitly means, holds great potential for economic growth: More hands mean greater accomplishments. Simultaneously and implicitly: More mouths entail greater consumption and other difficulties.

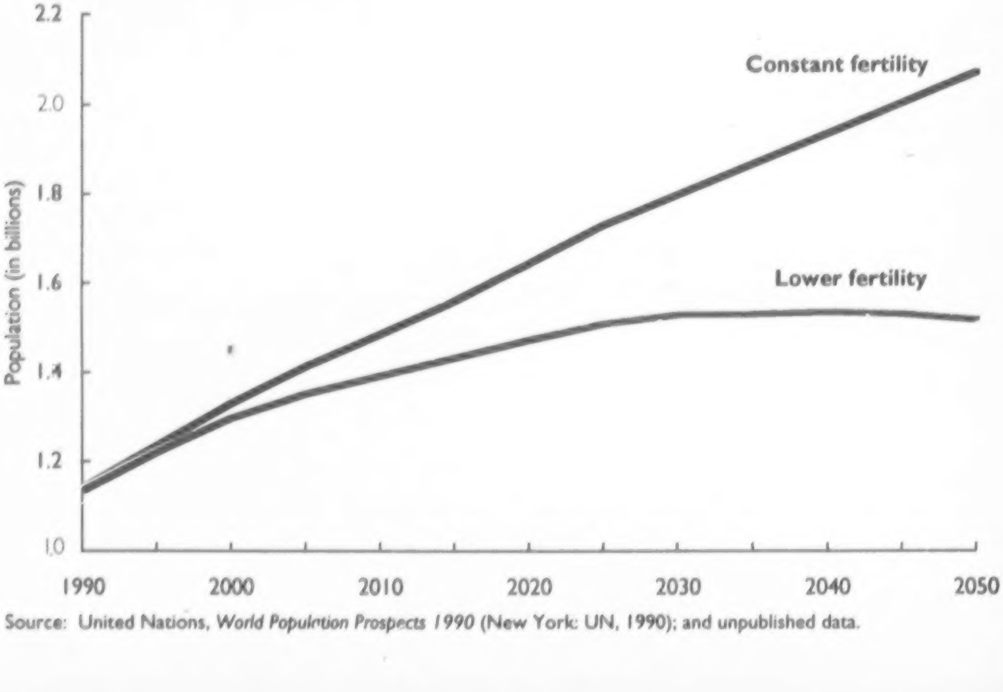
Renduo trenchantly sums up both China's past faith and the present fear in population numbers. Ironically, the present fear is expressed in ways that acknowledge the finite availability and relative scarcity of land and resources, tempering belief in *dida* and *wubo.* These fears have also been voiced alongside fervent articulations of the serious consequences of depleted resources and environmental pollution, and of the need for the current generation to control fertility for the sake of the generations to come.

The perspectives on *dida, wubo, renduo* thus have changed. The party and government have come to believe in population planning. A plethora of economic, political, international, and environmental factors are shaping the pace and breadth of China's population policies. Because of these policies, a rapid transition to low fertility has occurred. However, the specific population ceiling of 1.2 billion originally set for the year 2000 remains elusive. While the TFR among urban women has generally been below 1.5 throughout the 1980s, the TFR among their more numerous rural sisters has hovered around 2.8, always remaining well above the one-child goal.

China's fertility realities are at variance with the country's population planning goals, and China's age structure would prevent meeting the original population ceiling even if the fertility fell further. During the eighth five-year plan (1991-1995), women in the peak childbearing ages of 20 to 29 years will increase by 16 percent because of the high fertility two to three decades ago, prompting a modest baby boom. Even if the current population planning measures are strictly implemented, the national TFR would be 1.6, and an additional 17 million people would be added to the population each of those five years. The century-end population total will be probably be close to 1.3 billion (see Figure 9).

Figure 9

Projection of China's Population, 1990-2050



Source: United Nations, *World Population Prospects 1990* (New York: UN, 1990); and unpublished data.

The official target for 2000 has been raised to 1.294 billion but Chinese officials concede that even this will be difficult to achieve. In order to stay below this number the TFR must fall from 2.3 in 1990 to 2.1 in 1995 and below 2 by the century's end.[62] Under this scenario, China's population would reach about 1.6 billion by 2050, assuming no increase in the TFR.

If, during the next 10 years, fertility cannot be further reduced from the 1990 TFR of 2.3, the Chinese population will rise above 1.3 billion by 2000, top the second billion mark in 2050, and continue to grow unabated for decades thereafter.

It would be foolhardy to do more than conjecture about the size of the Chinese population half way into the 21st century. Nor would it be prudent to venture an opinion on when the Chinese population will stop growing. Evidence inside China allows no indulgence in this regard.

Many European and other developed nations have had below-replacement fertility (a TFR below about 2.1) for decades. But their demographic transitions evolved not only under a much longer time table, but under very different social, economic and political situations. Until early in the 20th century, the argument for limiting childbearing in the United States and Europe was to lessen the burden of excessive fertility on the individual, most particularly among the poor. Demographers labeled this a neo-Malthusian transition. As a social movement, neo-Malthusianism emerged against a backdrop of high fertility, encouraging "limited parenthood" or "having fewer children." One-child families or childlessness were not part of the message.

In time, controlling fertility emerged as a sophisticated, positive means to allow couples to pursue other life goals. Couples' fertility preferences consequently became more varied and more specific, including not just fewer children, but also only one child, even no children. One-child families and childlessness had become more common in the United States and parts of Europe before World War II. Although interrupted by the post-war baby boom of the 1950s and 1960s, below replacement TFRs eventually became widespread across post-war Europe and the United States.

Below or near replacement fertility rates are not a continuation of the neo-Malthusian transition. Their emergence has been quite appropriately acclaimed the second demographic transition.[63] Having fewer children was the main mechanism of change in earlier transitions. The second demographic transition entailed having only one child or none at all.

China's fertility realities are at variance with the country's population planning goals.

Such fertility preferences and behavior at the individual level grew out of rapid changes in socioeconomic conditions; in geographic and social mobility; in attitudes toward sex, marriage, and the family; and in beliefs about gender equality, extra-familial careers, and motherhood. In short, the ideas of having only one or no children gained ascendancy in an urban-industrial-ideological milieu that bears little resemblance to the backdrop of the previous, so-called neo-Malthusian transition.

Nor do the present socioeconomic conditions in China's vast countryside—beliefs about sex, marriage, and the family, and ideas of gender equality—resemble the situation in developed countries now practicing minimal reproduction and childlessness. Herein lie the limits to China's strategic demographic initiative.

China's recent economic gains make it clear that a large and growing population may not be of itself an obstacle to economic development. This observation does not endorse the view that larger populations stimulate growth. Rather, it emphasizes that China's national well-being may be contingent upon a balanced mix of demographic regulation and economic deregulation and related reforms.

"Opening up to the outside world" has received greater emphasis in recent reforms, especially in urban areas. Opening up has meant not only importation of capital, technology, and information, but also travel by individuals beyond national borders. Only a relatively small minority—in particular residents of major cities along the coast—have profited from these changes.

The great majority of the Chinese population in the countryside could also benefit from an "opening up to the outside," if that entailed allowing freer movement from crowded villages for educational and employment opportunities. Accelerated rural development and modernization may thus be facilitated, broadening the possibility of further or second fertility transition.

Development and modernization alone may not lower fertility. Nor is it likely that government policies alone can slow or stop the growth of the Chinese population. The difference between having fewer children and having a single child is enormous, not just in quantitative terms, but also in the quality of life. The way to a more satisfactory demographic future may best be paved by ensuring greater and more equitable educational and economic opportunities for all Chinese.

Yu Xun

Greater and more equitable educational and economic opportunities are the key to a brighter future.

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Discussion Questions

1. Discuss the unique cultural, demographic, social, and economic factors that characterize China's population. How have these characteristics affected the success of the strategic demographic initiative (SDI)?

2. Construct a chronology of China's population initiatives since the 1950s.

3. How much influence has the international community played in the shaping of China's population policies and the implementation of these policies?

4. Discuss the plausibility of the explanations given for the high sex ratios shown in China, since the implementation of the one-child policy.

5. Consider the implications of China's population size and structure for future policy decisions concerning aging, labor force, marriage, and minority populations.

6. Assess the impact of increased consumption in China on the global environment.

7. Compare China's demographic transition experience and age/sex structure with other developing countries and developed nations. Do you think that other nations can provide a model of possible future trends for China? What is the likelihood that China's SDI would be a model for reducing population growth in other countries?

8. Appraise the implications of "opening up to the outside world" for China and the global community.

9. The authors raise the argument, "...had the country's population planning been initiated earlier, in the 1950s and the 1960s, the level of economic development would have been higher than it has been." Do you agree?

10. China's population was about 1.17 billion in 1992 and projected to grow to 1.3 billion by 2000. This projection suggests that China will exceed the 1.2 billion ceiling originally set for 2000 in the SDI. Discuss the factors that have contributed to China's inability to attain this goal?

Prepared by Kimberly A. Crews

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New Realities of the American Family

by Dennis A. Ahlburg and Carol J. De Vita

Abstract—The American family has changed so much in just a few decades that it is difficult for individuals and social institutions to keep up. The breadwinner-homemaker model that once epitomized the American family has been replaced by a multitude of family forms—stepfamilies, single parents, unmarried couples, extended and multigenerational families, as well as families that "double up" to make economic ends meet.

This *Population Bulletin* explores the social, economic, and demographic trends that have contributed to the changing structure of the American family. It describes the various types of families that are prevalent today and projects their numbers into the future. It traces the paths to family formation (and dissolution) in terms of marriage, divorce, remarriage, widowhood, and childbearing, and explores the implications of these trends for the changing roles of family members. It also provides international comparisons on several key demographic traits that help place U.S. trends in a broad, global context.

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New Realities of the American Family

By Dennis A. Ahlburg and Carol J. De Vita

Decision Demographics, the consulting branch of PRB, provided special tabulations and projections of the American family for this Population Bulletin.

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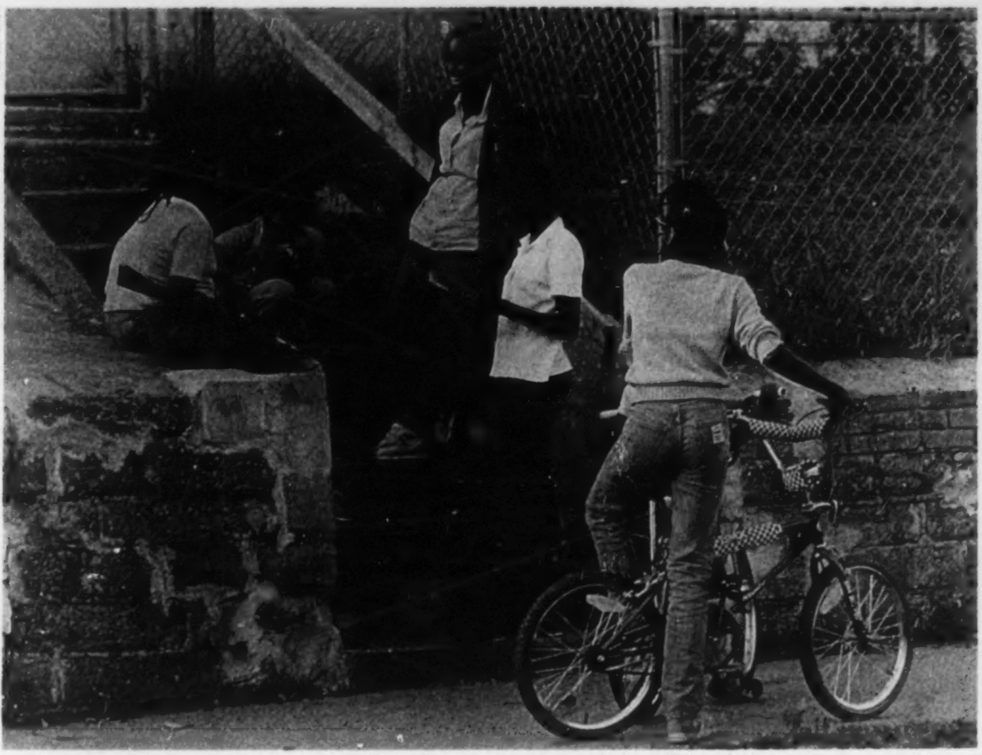
The family has changed so much in just a few decades that it is difficult for individuals and social institutions to keep up. Men and women who were raised in the 1950s and 1960s when television programs such as "Ozzie and Harriet" and "Father Knows Best" epitomized the image of the American family are now likely to find themselves in family situations that look and function very differently. Families today most likely have two or fewer children; there is a good chance that the mother is employed outside the home; and the odds of divorce before the children are grown are about 50-50.

The breadwinner-homemaker model with husband and wife raising their own biological (or adopted) children was once the dominant pattern. Today, many family forms are common: single-parent families (resulting either from unmarried parenthood or divorce), remarried couples, unmarried couples, stepfamilies, foster families, extended or multigenerational families, and the doubling up of two families within the same home. Women are just as likely to be full- or part-time workers as full-time homemakers.

If ordinary people sometimes find themselves puzzled about how to respond to (or interpret) the new family patterns, so are the experts. Family patterns are so fluid that the U.S. Census Bureau has difficulty measuring family trends. Most large-scale, nationally representative surveys cannot readily tell us what proportion of husband-wife families are stepfamilies; how adopted or foster-care children are faring; distinguish roommates from couples who are living together as unmarried partners; or measure the extent of family support networks for elderly persons who live alone.

Workplace policies often lag behind the new family arrangements, as the movement to pass "parental leave" or "family leave" policies suggests. Family health insurance, which is often provided through the workplace, may cover only married husband-wife partners and their off-spring, not cohabiting couples. Gay and lesbian advocates have questioned the fairness of these restrictions based on the premise that the living arrangements of gays and lesbians function much the same way as married-couple families. Stepfamilies may encounter a maze of bureaucratic red tape in trying to establish whose children are covered by which insurance policy. Family law—particularly the advent of no-fault divorce law, joint child custody, and inheritance and estate planning—has slowly evolved to try to accommo-

Kate Sharp



Michael Siluk

African-Americans are twice as likely to become parents while still in their teens as are whites or Hispanics.

date the new fluidity of marital and family arrangements.

As a consequence, few social institutions have received as much attention and scrutiny as the American family. The family unit forms the cornerstone for U.S. social policy, and the economic well-being of the family often serves as a barometer for measuring the well-being of the nation. Given the importance of the family, it is not surprising that current statistics on the formation and structure of American families have been viewed with alarm:

- the marriage rate fell almost 30 percent between 1970 and 1990;
- the divorce rate increased by nearly 40 percent during this same period;
- over one-quarter of all births in 1990 were to unmarried mothers, compared with one in ten in 1970; and
- about half of all children today are expected to spend some part of their childhood in a single-parent home.

Demographic trends are key to this evolution. Marriage, divorce, widowhood, remarriage, and childbearing patterns have changed dramatically since the 1950s and have radically altered the size and composition of the American family. Young people are marrying at older ages and more are foregoing marriage altogether. Marriage is less permanent. People are more likely to divorce, although remarriage rates are high. Women are having fewer children and generally waiting until older ages to have them. But more births are occurring outside of marriage, and more children are being raised in single-parent homes. Intertwined with demographic factors are economic changes—the stagnation of men's wages, the loss of manufacturing jobs, increased competition in global markets—that have contributed to the difficulties of raising and sustaining families.

This report will discuss the social and demographic trends that contribute to the changing composition and economic status of the American family. It will describe the various types of families that are prevalent today and project their numbers into the future. It will trace the paths that lead to family formation (and dissolution) in terms of marriage, divorce, remarriage, widowhood, and childbearing patterns, and it will explore the implications of these trends for the changing roles of women and men, as well as for the social and economic well-being of children.

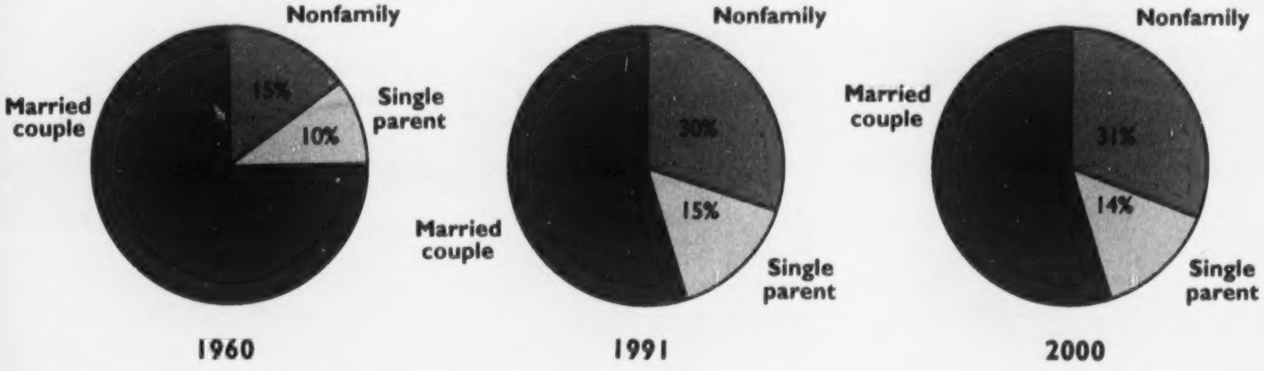
The United States is not alone in experiencing such far-reaching demographic change. Family patterns in the United States reflect broad social and demographic trends that are occurring in most industrialized countries around the world. Low marriage and fertility rates and high divorce and nonmarital birth rates are seen in many other industrialized nations. Although every country has its own social and political traditions, Americans can learn important lessons by studying how other nations are responding to these changes. This report provides crossnational comparisons on several key demographic factors that help place U.S. trends in a broad, global context.

Defining Households and Families

The U.S. Bureau of the Census carefully distinguishes between a *household* and a *family*. Households are defined as all persons who occupy a housing unit such as a house, apartment, single room, or other space intended to be living quarters. A household may consist of one person who lives alone or several people who share a dwelling. A family, on the other hand, is two or more persons related by birth, marriage, or adoption who reside together. This definition does not measure family ties that extend beyond the immediate housing unit. Yet, family members who live outside the home often help older people, young couples, and single parents maintain their independence and meet family responsibilities.

While all families form households, not all households are families under Census Bureau definitions. Indeed, the growth of the nonfamily household (that is, persons who live alone or with unrelated individuals) is one of the most dramatic changes to occur during the past 30 years. In 1960, 15 percent of all households were nonfamily households; by 1991, 30 percent were nonfamily units, and by the year 2000, 31 percent may be nonfamily households (see Figure 1). Nonfamily households are a diverse group. They may consist of elderly individuals who live alone, college-age youth who share an apartment, cohabiting couples, individuals who delay or forego marriage, or those who are "between marriages." While these individuals may not reside within an officially designated family unit, most have family ties beyond their immediate household. What is more, given the aging of the U.S. population and current patterns of marriage, divorce, childbearing, and widowhood, nonfamily households are expected to account for a growing share of the housing market well into the 21st century.

Figure 1
U.S. Households, 1960, 1991, 2000



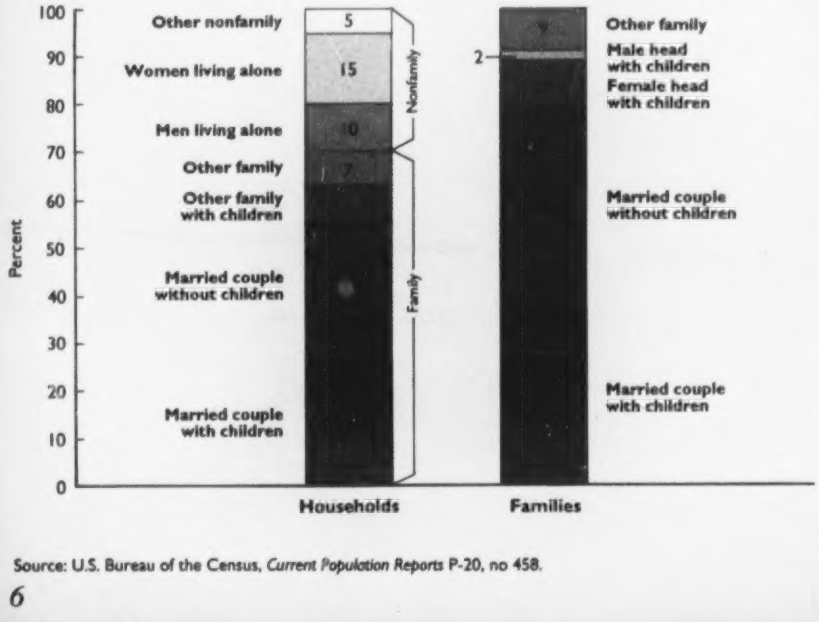
Source: U.S. Bureau of the Census. Projections by Decision Demographics.

Types of Families

While the share of family households has declined in the past 30 years, the structure of American families has grown more complex. A popular image of the American family is a married couple with two or more children in which the husband is the sole source of family income and the wife stays at home to attend to family matters. The demographic reality is that in 1991 just over one-third of all families (37 percent) consisted of a married couple with children—regardless of the number of children or the labor force status of the wife—and only one in five married couples with children fits the popular stereotype described above.

Although 70 percent of households contain a family unit, family composition is quite diverse, as shown in Figure 2. They include: married couples with children, married couples without children, single-parent families headed by a woman, single-parent families headed by a man, and other family units, such as siblings living together, an unmarried daughter living with her aging mother, or grandparents raising grandchildren. Just under half of all families have children, but there is considerable variation in these family arrangements.

Figure 2
Household and Family Composition, 1991



Source: U.S. Bureau of the Census, *Current Population Reports* P-20, no 458.

Married Couples with Children

Despite our changing lifestyles, married couples with children continue to be a prominent family pattern. But even within this model there are two distinct types: the intact biological family and the step- or blended family that may include adopted children. Most married-couple families with children are intact biological families (77 percent in 1985, the last available estimate), but 19 percent had one or more stepchildren, and 2 percent had one or more adopted children.[1] Although over 80 percent of stepfamilies are white, the odds of being in a stepfamily are twice as great for African-Americans as for whites. Thirty-five percent of all black married-couple families in 1985 were stepfamilies, compared with 18 percent for whites. The vast majority of stepchildren in married-couple families live with their biological mother and stepfather. Demographer Paul Glick estimates that one out of every three Americans is now a stepparent, a stepchild, a stepsibling, or some other member of a stepfamily. If current trends continue, the share will rise to nearly half by the year 2000.[2]

Combining and blending families is not always easy and does not necessarily mitigate differences between family types. Compared with stepfamilies, intact biological families tend to involve marriages of longer duration, have more children, are somewhat more likely to have only one parent in the labor force, and have higher family income.[3] Blended families may also generate conflict and tension, particularly for children, which is sometimes seen as a factor in the high divorce rates among remarriages.

Married Couples without Children

Forty-two percent of all families in 1991 consisted of married couples without children. But again, there are distinct differences within this category. Some of these couples might be called *preparents* (those who have not yet had children); others may be *empty nesters* whose children are grown and have left the family home; while others may be

Table 1

Family Composition in the United States, 1970-2000

Type of family	1970	1990	1995	2000
All families (in millions)	51.2	64.5	68.0	71.7
Total	100.0%	100.0%	100.0%	100.0%
Married couple with children	49.6	36.9	36.2	34.5
Married couple without children	37.1	41.7	41.8	42.8
Female head with children	5.7	10.2	10.0	9.7
Male head with children	0.7	1.8	2.2	2.7
Other families	6.9	9.4	9.8	10.3

Source: Projections prepared by Decision Demographics. Data for 1970 from U.S. Bureau of the Census, *Current Population Reports* P-20, no. 218.

nonparents either by choice or because of infertility problems. Among married couples without children in 1991, about 15 percent of the women were under age 35, suggesting a possible delay in childbearing. Indeed, over half of all married women younger than 35 who were childless in 1990 reported that they expected to have a child at some point in the future.[4] This figure rises to over 80 percent for married women in their twenties. On the other hand, half of all married couples without children had a woman age 55 or older. Many women of this age group are the mothers of the post-World War II baby-boom generation and probably have adult children who live elsewhere.

The aging of the baby-boom generation (born 1946-1964) will affect the growth of families without children. While many younger baby boomers (born 1957-1964) are still in the preparent stage of family life and are likely to become parents in the not-too-distant future, older baby boomers (born 1946-1956) who currently have children at home will soon be entering the empty nest phase. Projections by Decision Demographics show that married couples without children are likely to represent 43 percent of all families in 2000 if current trends in family formation remain unchanged (see Table 1).

Single-Parent Families

Nearly one in eight families was headed by a single parent in 1991, double the proportion in 1970. Women were five times more likely than men to be raising a family alone in 1991, and African-Americans were almost three times more likely than whites to be single parents. Single-parent families represented one in five white families with children, one in three Hispanic families with children, and six in ten black families with children. As will be discussed in more detail below, changing patterns of

Michael Siluk

In 1989 about one in three children was born to a mother over age 30.

marriage, divorce, remarriage, and the rise in births to unmarried women have contributed to the growth of single-parent families. "About half of today's young children will spend some time in a single-parent family, most as a consequence of divorce . . ." writes demographer Larry Bumpass. "Furthermore, this is not just simply a transitional phase between a first and second marriage. The majority will reside in a mother-only family for the remainder of their childhood."[5]

Living Arrangements of Children, Young Adults, and Elderly

The growing diversity of U.S. family life in the 1990s is most apparent in the living arrangements of children, young adults, and older persons. These groups have experienced the most dramatic change.

Children

One quarter of all children (or 16.6 million children) in 1991 lived with only one parent—double the percentage of 1970 and almost triple that of 1960. Minority children were most affected by this change. In 1960, two-thirds of African-American children lived in two-parent homes; by 1980, less than half (42 percent) did so, and by 1991, only one-third (36 percent) were in a two-parent family. The number of Hispanic children in one-parent homes almost doubled between 1980 and 1991, reaching 2.2 million (or 30 percent) of all Hispanic children. High divorce rates and out-of-wedlock childbearing contributed to this trend.

But difficult economic times have also resulted in more families "doubling up," that is, sharing a common household together. Since 1970, the share of children who live in their grandparents' home has risen from 3 percent to 5 percent in 1991. These data reflect children (and their parents) who live in the home of the grandparent, not arrangements whereby grandparents move in with their adult children and grandchildren. About 3.3 million children lived in their grandparents' home in 1991. African-American children are three times more likely than white children to live with grandparents (12 percent vs. 4 percent, respectively). About 6 percent of Hispanic children live with grandparents.

Doug Goodhill

Increases in life expectancy mean that more children will get to know their great-grandparents.

Cleo Photo

Living at home has become increasingly common for students and young adults.

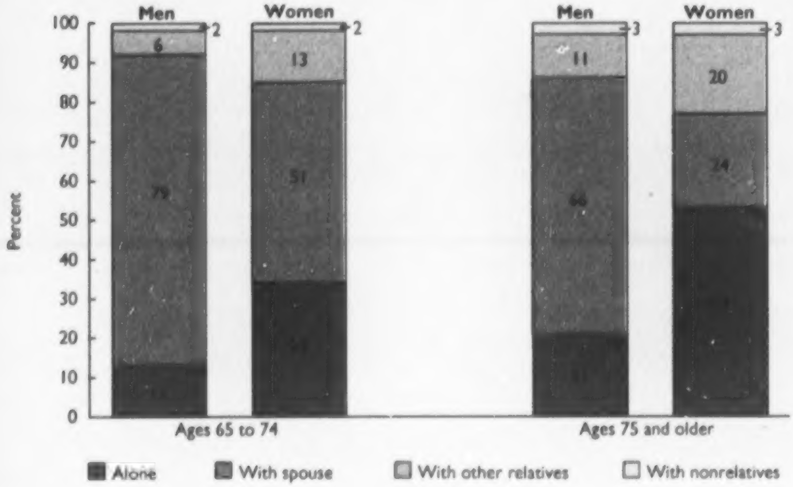
In most cases, one or both parents are present in the household. For half of these households, only the mother is present; in 17 percent, both parents are present. The "doubling up" of two-parent families within the grandparents' home increased during the 1980s (13 percent in 1980) as families responded to difficult economic conditions. In 28 percent of these households, neither parent is present, however, and grandparents are solely responsible for their grandchild.

Young Adults

The transition from being a dependent in the parental home to establishing an independent household has become increasingly complex and diverse. Compared with the 1970s, more young adults (ages 18 to 24) are living at home with their parents, more are living alone or with roommates, and fewer are maintaining married-couple family households of their own. Over half (54 percent) of all 18- to 24-year-olds lived with their parents in 1991—up from 47 percent in 1970. Some of these young adults never left the family home after completing high school; others are college students who live at home at least part of the year. Even by ages 25 to 34, about 12 percent of young adults in this age group were at home with their parents—up from just 8 percent in 1970. Inflationary pressures, the rising cost of housing, slower wage growth, the increased cost of higher education, and the repayment of student loans are seen as important factors that have kept young adults at home with their parents. Less than half (48 percent) of adults under age 35 were the head (or spouse of the head) of a separate family household in 1991.

For those who can afford it, living alone or with roommates has also become increasingly common. So, too, has cohabitation—that is, living with someone in a sexual union without a formal marriage. Three million households in 1991 had cohabiting couples, nearly 60 percent of whom were under age 35. Cohabitation has increased sixfold since 1970 when only 500,000 households had cohabiting couples. Only opposite-sex couples are counted in these figures, so these data underestimate the extent of cohabitation in the United States today.[6]

Figure 3
Living Arrangements of the Elderly, 1991



Note: These figures do not include the 5 percent of elderly who live in institutions.
Source: U.S. Bureau of the Census, *Current Population Reports* P-20, no. 461.

Kenneth C. Poertner

Finding a partner can be difficult for older women who outlive and outnumber older men.

About one-third of all cohabiting, opposite-sex couples in 1991 had children under age 15 present in their homes, but far more cohabiting couples are parents. By one estimate, almost half of cohabiting couples have children either living with them or living elsewhere with a custodial parent.[7]

Cohabitation is often seen as a prelude to marriage. Although only 5 percent of women ages 15 to 44 were cohabiting with a male partner in 1988, one-third had done so at some time in the past.[8] One-quarter of white women, one-quarter of Hispanic women, and nearly one-third of black women had lived with their first (or only) husband before marriage. Among single persons who plan to cohabit in the future, more than 80 percent said that cohabiting allows couples to make sure they are compatible before getting married. At least one of the partners expects the arrangement to result in marriage in 90 percent of cohabitations.[9] Respondents may be overly optimistic, however: 55 percent of first cohabiting unions of white women and 42 percent of those of black women resulted in marriage.[10]

It is important to note that the rise in cohabitation has helped to offset much, although not all, of the fall in marriage rates.[11] If we expand our notion of "marriage" to include legal marriage *and* cohabitation, there has been little decline in the institution of marriage in the United States.

Elderly

Often overlooked in the discussion of families is the living arrangements of older persons. The majority (54 percent in 1991) of persons age 65 and older are in married-couple households. But this fact masks considerable differences in living arrangements by the age and sex of the older person (see Figure 3). It also masks the role that the extended family network plays in the support and care of older individuals.

Three out of four men ages 65 and older lived with their wife in 1991, whereas less than half (40 percent) of older women lived with their husband. Because women tend to live longer than men, there are more older women than older men. Most older women live alone, particularly after age 75. This is likely to increase the need for assistance from family, friends, or social agencies as failing health or chronic disabilities rob older individuals of their independence. In general, older women are twice as likely as older men to live with other family members, although by age 85, the difference narrows somewhat. About 5 percent of all persons age 65 and older were living in institutions, such as nursing homes, in 1990.

Paths to Family Formation

Changes in household and family composition are a normal part of the life course of individuals. Families grow or contract in size through demographic events such as marriage or divorce, births or deaths. But these paths to family formation (and dissolution) have grown more complex and helped create today's new patterns of family life.

Marriage Trends

Significant changes have been occurring in U.S. marriage patterns. Individuals are postponing marriage until older ages, and more people are foregoing marriage altogether. Compared with the 1960s, marriages have a shorter average duration, and a smaller proportion of a person's life is spent in marriage, despite gains in life expectancy.[12]

While these facts often lead to speculation that the institution of marriage is crumbling, the number of marriages that occurred throughout the 1980s was at an all time high. Roughly 2.4 million marriages were performed each year during the past decade. A careful look at marriage trends reveals how marriage patterns are creating new lifestyles and expectations.

Marriage Rates

Yearly marriage rates are driven by many factors: the number of young adults in the population who reach marriageable age, changes in marriage patterns, economic cycles, even the mobilization of a population for war (see Box 1). The number of marriages per 1,000 population reached a peak of 16.4 in 1946 at the end of World War II and a low of 8.4 in 1958 when an economic recession coincided with a relatively small number of young adults reaching marriageable

Box 1

How Demographic Rates Are Calculated

Demographers usually report demographic events in terms of rates—marriage rates, divorce rates, birth rates, and so forth. A rate tells how frequently an event is occurring—how common it is. But rates are calculated in a number of ways; each one portrays its own story.

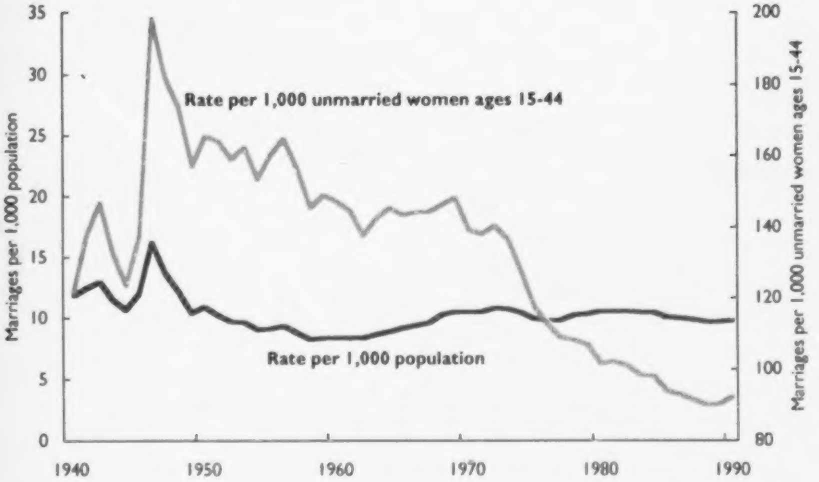
The most simple and straightforward rate is the crude rate. This is computed for the entire population. For example, the marriage rate gives the number of marriages per 1,000 total population in a given year. This rate is calculated using the number of marriages—*not* the number of people getting married—and includes both first marriages and remarriages. The number of marriages is divided by the total population.

But rates can also be age-specific, gender-specific, or race-specific—that is, they are based on the number of people in a specific group, usually the population at risk of having the event occur. The marriage rate for unmarried women of childbearing age, for example, is based on the number of marriages in a given year divided by the number of unmarried women ages 15 to 44.

As figure 4 in the text shows, the story of marriage trends depends in part on which marriage rate is used to describe the event. Refined rates, which generally limit the denominator to the population at risk, reflect changes in population composition and are more likely to show more dramatic change over time.

Figure 4

Marriage Rates, 1940-1990



Source: National Center for Health Statistics, *Advance Report of Final Marriage Statistics, 1988*, and provisional data.

age (see Figure 4). Throughout the 1970s and 1980s, the marriage rate for the total population fluctuated between 10.6 and 9.7.

While the crude marriage rate has not shown dramatic change in the last two decades, there are decided changes in the timing of marriage. Men and women of the baby-boom generation delayed entry into marriage. The marriage rate for unmarried women ages 15 to 44 began to plummet around 1975, and by 1988, it was at an all-time low of 91.0 per 1,000. The record high number of marriages in recent years occurred because the size of the population has grown; the record low marriage rates to unmarried women happened because women have postponed entry into marriage.

Age at Marriage

Another way of looking at this trend is by the median age at first marriage (see Table 2). For the first half of the 20th century, median age at first marriage fell for both men and women, reaching a low of 22.5 years for men and 20.1 years for women in 1956. Social attitudes and the expanding U.S. economy of the 1950s encouraged many young couples to begin married life at a relatively young age. But by the mid-1970s, as both social attitudes and economic conditions changed, median age at first marriage reversed course and climbed upward. By 1991, it reached 26.3 years for men and 24.1 years for women. Compared with their counterparts in the 1950s, young adults in the 1990s are delaying entry into marriage, but the patterns that they are following today are surprisingly similar to those recorded nearly 100 years ago. What is more, U.S. marriage patterns are also similar to other industrialized countries. In Denmark, for example, the median age at first marriage for men is 29.2 and for women 26.5.[13]

While Americans may be delaying entry into marriage, almost everyone gets married—at least once. In 1990, 95 percent of women and 94 percent of men ages 45 to 54 had been married. Indeed, the United States has one of the highest marriage rates in the world. In Sweden, for example, only 75 percent of men who are now 45-years-old

Table 2

U.S. Median Age at First Marriage, 1890-1991

Year	Men	Women
1890	26.1	22.0
1900	25.9	21.9
1910	25.1	21.6
1920	24.6	21.2
1930	24.3	21.3
1940	24.3	21.5
1950	22.8	20.3
1955	22.6	20.2
1960	22.8	20.3
1965	22.8	20.6
1970	23.2	20.8
1975	23.5	21.1
1980	24.7	22.0
1985	25.5	23.3
1986	25.7	23.1
1987	25.8	23.6
1988	25.9	23.6
1989	26.2	23.8
1990	26.1	23.9
1991	26.3	24.1

Source: U.S. Bureau of the Census, *Current Population Reports* P-20, no. 450 and P-20, no. 461.

have married. For other European countries, the proportion who ever-marry is higher than in Sweden but lower than in the United States.[14]

Nevertheless, some observers fear that the pattern of delayed age at first marriage in the United States could eventually lead to fewer people ever getting married—that is, "later" could lead to "never." The probability of getting married declines with age. It is highest for men and women in their twenties and then drops quickly after age 30. While the proportion of Americans age 45 and older who have never married is less than 10 percent, the percentage of 30-year-olds who have never married almost doubled between 1970 and 1990. A recent study has estimated that about 12 percent of white women and 25 percent of black women who were ages 30 to 34 in 1990 may never marry.[15]

Racial differences in marriage patterns have also changed. Before World War II, similar proportions of blacks and whites married, but blacks tended to marry at younger ages. Today, this pattern is reversed. The average age of first marriage for African-Americans now exceeds that of whites by two years and a smaller proportion of black women marry. In 1988, the average age at first marriage was 26 years for black women and 24 years for whites; 84 percent of black women ages 40 to 44 had married at least once compared with 93 percent of white women.[16]

Interracial Marriage

Interracial marriage has become more accepted over time, according to public opinion polls. About 2 percent of all married couples in 1991 had interracial marriages—up from less than 1 percent in 1970.[17] About one in four interracial marriages was between black and white partners. The vast majority of these pairs were a black husband and a white wife. On the other hand, nearly half (45 percent) of all interracial marriages were between a white husband and a nonblack wife. A white wife and nonblack husband accounted for 27 percent of interracial couples in 1991.

Although the incidence of interracial marriage has increased in recent years, it is still not very common and often meets strong resistance. Roughly one-quarter to one-third of unmarried adults under age 35 said that they were "not at all willing" to marry someone of a different race, according to a national survey conducted in 1987. Less than 10 percent said that they would be "very willing."[18] Negative attitudes toward interracial marriage were strongest among women, non-Hispanic whites, and individuals with 12 years or less education.

Reasons for Changing Patterns

Social, demographic, and economic factors have all contributed to the changing patterns of marriage behavior. Societal norms towards marriage have changed since the 1950s when most young people were expected to marry and have two children as soon as economic circumstances permitted.[19] Attitudes toward cohabitation began to change during the 1960s and the rise of the women's liberation movement in the 1970s presented new options for women beyond the traditional marriage and family roles. Neither cohabitation nor the women's liberation movement, however, fully explains the long-term pattern in marriage rates, although both factors are frequently cited as either the cause or the consequence of changing marriage patterns.

Demographers sometimes cite the demographic "marriage squeeze" as an explanation for changing marriage rates. Women tend to marry men who are somewhat older than themselves. As birth rates rise or fall over time, a shortage or surplus of potential marriage partners is created. For women born in the early 1950s (the first half of the baby boom), there were simply too few eligible men for the number of women of marriageable age. Thus, marriage rates began to drop in the early 1970s. The importance of the marriage squeeze has been hotly debated among demographers and social scientists, but it does provide at least a partial explanation for the decline of marriage rates.[20]

Economic factors also played a role. As women's education and employment opportunities expanded, so did women's wages. The rise in women's wages during the 1970s and 1980s rela-

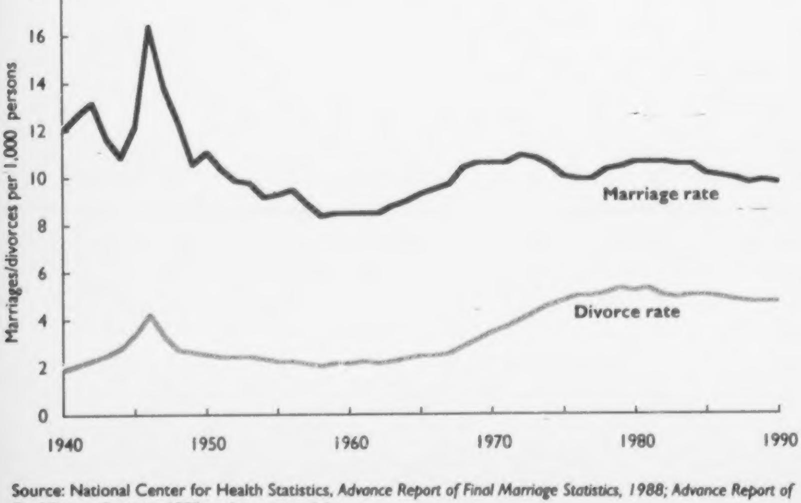
The United States has one of the highest marriage rates in the world.

tive to those of men may have lessened the economic incentive for women to marry.[21] Likewise, the earnings of young men began to stagnate (and for some groups, deteriorate) during this same period, making the prospect of marriage less affordable for many men. Men's earnings rose in the 1950s and then fell by about 20 percent between 1972 and 1989. Marriage rates followed a roughly parallel course.

The attitudes of young adults today reflect the complex economic aspects of marriage. A national survey of unmarried adults under age 35 found that almost one-half of the women and just over one-quarter of the men said that they would be "very willing" to marry someone who earned "much more" than they did.[22] On the other hand, about 20 percent of minority women (that is, blacks, Hispanics, and other minorities) and 12 percent of non-Hispanic white women said that they would be "not at all willing" to marry someone who would earn "much less" than they did. Only about 5 percent of the young men in the survey said that they would not be willing to marry a woman who earned much less than they did. Even more important than earnings is the prospect for employment. More than two-thirds of the young women in the survey and one-third of the young men said that they would be "not at all willing" to marry someone who was not likely to hold a steady job. The percentage of young adults who shared this attitude was fairly consistent across racial and ethnic groups. For the majority of young women and for a substantial share of young men, having a partner who can contribute to family income is an important criteria in deciding whether or not to marry.

Figure 5

Divorce and Marriage Rates, 1940-1990



Source: National Center for Health Statistics, *Advance Report of Final Marriage Statistics, 1988; Advance Report of Final Divorce Statistics*, 1988, and provisional data.

Divorce Trends

While 2.4 million marriages occurred in 1990, 1.2 million divorces occurred during that same year. Marital discord and divorce are certainly not new, but dissolving a marriage by divorce has grown more common.

Divorce Rates and Risks

Except for a sharp increase immediately after World War II, U.S. divorce rates hovered around 2.4 divorces per 1,000 population throughout most of the 1950s and 1960s (see Figure 5). Then followed a steady swell. Between 1965 and 1970, the divorce rate rose from 2.5 to 3.5; by 1975, it had reached 4.8, and by 1980, 5.2. Rates did not show any sign of decline until the mid-1980s, and for now have leveled off at around 4.7. Compared with the 1960s, both the number of divorces and divorce rate have more than doubled.

Rising divorce rates are not unique to the United States (see Table 3). Most industrialized nations have experienced similar patterns. Divorce rates in both Sweden and Germany, for example, doubled between 1960 and 1988. But divorce is (and has always been) far more prevalent in the United States than elsewhere.

The growing incidence of divorce has affected virtually all groups within U.S. society. Among white and Hispanic women ages 15 to 44 in 1988, over one-third had experienced the dissolution of their first marriage; among blacks, the figure was nearly half.[23] Although younger people are more likely to divorce than older ones, rates of divorce have increased for all age groups except those 65 and older. Even religious sanctions against divorce seem to have little bearing on divorce rates. Catholics are no less likely to divorce than non-Catholics, despite strong opposition to divorce by the Catholic church.[24]

The probability that an individual will experience a divorce is higher among younger generations. Whereas 14 percent of white women who married in the early 1940s eventually divorced, almost half of white women who married in the late 1960s and early 1970s have already been divorced. For African-American women, the percentages rose from 18 to almost 60.[25] Indeed, the rapid rise in divorce rates can be illustrated by the following calculation: nearly 30 percent of couples who were married in 1952 were divorced by their 25th wedding anniversary; couples married in 1957 took only 20 years to experience a similar attrition; those married in 1962 took 15 years; and couples married in 1967 took about 10 years.[26]

Although the divorce rate declined slightly and then leveled off in the late 1980s, this is not necessarily a sign that fewer marriages will end in divorce. Demographic trends suggest that the composition of marriages has changed toward more stable marriages. The increasing age at first marriage suggests that marriages may be more selective now than in the past and therefore less at risk of divorce. Also, the aging of the baby-boom generation means that a substantial portion of the adult population has passed through the stage of life when the odds of divorce are highest. Yet, changing attitudes toward men's and women's roles, as well as increasing economic opportunities for women, will continue to redefine family patterns and could lead to another upsurge in divorce. Some scholars are beginning to view these patterns of high divorce and remarriage rates as an intrinsic part of contemporary family life.[27]

Reasons for High Divorce Rates

The prevalence of divorce in U.S. society has been seen as symptomatic of an erosion of the American family and American values. Another way of looking at these statistics, however, is that Americans today place a higher value on forming a *successful* marriage than did earlier generations. People may now expect more of marriage and be less tolerant of marital problems. If irreconcilable problems arise, divorce is seen as an acceptable alternative to an unhappy marriage.

Table 3

Divorce Rates for Selected Countries, 1960-1988

Country	Divorces per 1,000 married women			
	1960	1970	1980	1988
United States	9.2	14.9	22.6	20.7
Canada	1.8	6.3	10.8	12.6
France	2.9	3.3	6.3	8.4
Germany (western)	3.6	5.1	6.1	8.8
Japan	3.6	3.9	4.8	4.9
Sweden	5.0	6.8	11.4	11.4
United Kingdom	2.0	4.7	12.0	12.3

Source: *U.S. Statistical Abstract, 1991.*

The first no-fault divorce law was passed in 1969 in California, and most states now have some form of no-fault divorce. This action helped reduce the stigma of divorce by making moral issues such as marital infidelity less relevant in divorce proceedings. The division of property and child custody rights have become the major concern of divorcing couples.

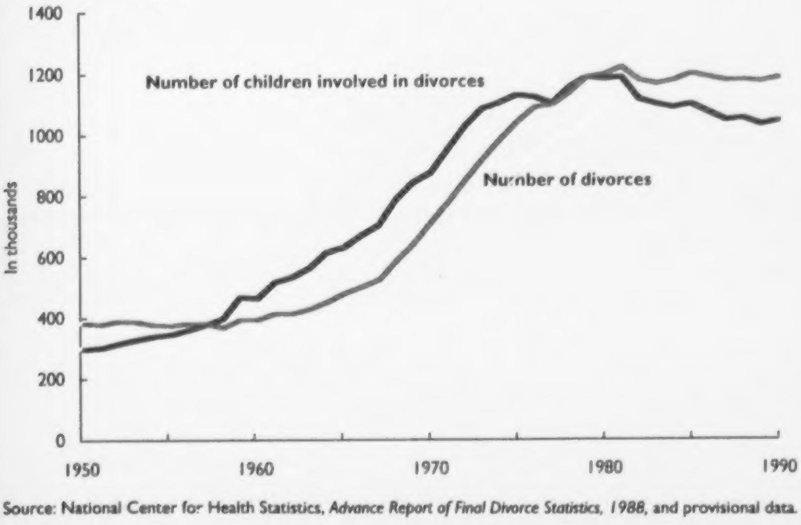
Both economic and attitudinal changes have contributed to the growing incidence (and acceptance) of divorce. The entry of women into the labor force broke down the traditional division of labor within the family, blurring gender role distinctions within marriage. The male breadwinner-female homemaker model was gradually replaced by the two-earner couple model. For many men, the new marriage pattern provided less domestic support and less deference in decisionmaking than did the old model. For many women, greater economic independence meant that they did not have to remain in an unsatisfactory marriage. Emotional gratification therefore has become a more central part of defining what is a good marriage.[28]

But changing attitudes also played an important role. Although most Americans subscribe to the idea that marriage should be a lifetime commitment, most couples recognize that divorce is a viable option should their marriage not work out. Indeed, a diminishing share of Americans believes that couples should stay together in an unhappy marriage even when children are involved. A survey of young mothers in 1962, for example, asked whether couples with children ought to remain together if they could not get along. Half of the respondents said they should. But when these same women were asked the identical question in 1985, fewer than one in five replied that unhappy couples should stay together.[29] Acceptance of divorce was also reflected in the attitudes of the younger generation. Ninety percent of the daughters of these women and 70 percent of the sons (age 23 at the time of the 1985 survey) said that unhappy couples with children should not stay together.

For many individuals, staying together, even for the good of the children, is no longer considered a sufficient justification for staying in an unsatisfactory marriage. It is, of course, impossible to disentangle whether these changing attitudes are a cause or a consequence of increasing rates of divorce, but "secular individualism" which gives priority to the parent's interests over those of the children has become increasingly common.[30]

Figure 6

Number of Divorces and Children Involved in Divorce, 1950-1990



Source: National Center for Health Statistics, *Advance Report of Final Divorce Statistics, 1988*, and provisional data.

Children Involved in Divorce

Divorce affects not only adults but also children. Over 1 million children under age 18 saw their parents divorce in 1990. The number of children involved in divorce soared during the 1960s and 1970s, but has gradually declined since 1980 (see Figure 6). This drop can be attributed, in part, to the decline in the divorce rate during the 1980s, but also to the smaller number of children in married-couple families.

Still, the odds of seeing parents divorce are twice as great today as a generation ago. The number of children involved in divorce per 1,000 children under age 18 was 16.2 in 1990—double the rate of 8.2 recorded in 1963. Slightly more than half of divorcing couples in 1988 had children under 18 years of age. About 26 percent had one child, 20 percent had two children, and 7 percent had three or more children.[31]

During the first half of this century, about one in four children experienced their parent's divorce before they reached the age of 18.[32] Current estimates are that half of all children—at least one-third of white children and two-thirds of black children—will experience the breakup of their parent's marriage.[33] What is more, about 44 percent of white children and 66 percent of black children who saw the breakup of their parent's first marriage will also see the breakup of a parent's second marriage. The majority of children of divorce will remain in mother-only families for the remainder of their childhood.[34]

It was often thought that children held a marriage together. It now appears that this is true only for young children born within the marriage. As children grow older or as stepchildren enter a family, emotional or financial strain on the marital relationship may expand, increasing the chances of divorce. A recent study found that the stabilizing effect of children in a marriage is only slightly larger than the destabilizing effect. Married couples with children are only slightly more likely to celebrate their 20th wedding anniversary than are childless couples.[35]

Remarriage

Most Americans who divorce eventually remarry. One-third of all marriages in 1988 were remarriages for one or both partners. In fact, the high incidence of remarriage is driven more by the growing number of formerly-married people who are "available" to remarry than by the increasing likelihood that a divorced person will remarry.

For those who remarry, the average length of time between marriages is relatively brief. In 1988, the median interval between divorce and remarriage for a woman was 2.5 years; for a man, 2.3 years. But just as couples have tended to postpone entry into first marriage, they also have stretched the time between marriages. In 1970, the median interval between divorce and remarriage was only about one year.

A national study of women's marriage patterns showed that divorced African-American women are slower to remarry and less likely to remarry than divorced white women. For women whose marriages ended between 1965 and 1984, only 34 percent of black women had remarried by 1988, compared with nearly 60 percent of white women. Remarriage rates for Hispanic women are roughly midway between black and white women. About 45 percent of divorced Hispanic women in the study had remarried by 1988.[36]

An individual's age, income, education, and the presence of children also affect remarriage rates.[37] Younger women remarry more quickly than older women. Women divorced after age 40 have a low probability of remarriage, although the remarriage rate among widows at older ages is increasing. For men, age does not appear to be an important factor.

Income and education are important predictors of remarriage for both men and women, however, men who are better-off economically are more likely to remarry than those who are less well-off. The reverse relationship holds for women. Among women, education appears to be unrelated to the chances of remarrying for whites, but higher educational attainment increases the chances of remarrying for blacks. Remarriages are more stable than first marriages for African-Americans, although overall divorce rates are higher for blacks than for whites in both first and subsequent marriages.[38]

The presence of children is an important factor in remarriage rates of women but not of men.[39] Because women tend to be the custodial parent in the vast majority of divorce cases, the presence of children lowers the probability that a woman will remarry. Noncustodial fathers often assume the role of "serial parent," that is, they provide financial support and are a role model to either step- or biological children in the man's new relationship.

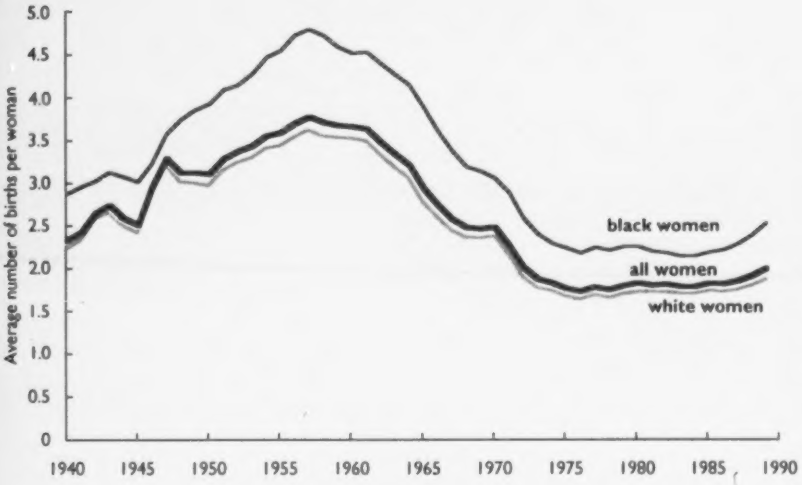
One final note: Not all remarriages are to divorced persons. Just under 10 percent of all remarriages in 1988 were to persons who had been widowed. Widowed persons who remarry are, on average, older than those who divorce and remarry. One obvious reason is that, unlike divorce, widowhood tends to be concentrated at the older ages. Nearly 60 percent of previously widowed brides and grooms in 1988 were age 55 or older; in contrast, half of those previously divorced were age 35 or younger when they remarried. As in the case of divorce, the odds of remarriage for widowed persons are greater for men than for women. Because women tend to outlive men, the demographic "marriage squeeze" for women is extremely pronounced after age 65. In 1991, for example, there were 29 unmarried older men for every 100 unmarried older women in the United States. Also, women who are widowed tend to wait longer before remarrying than women who are divorced. The median interval between the death of a spouse and remarriage was 2.3 years for men and 4.6 years for women.

The presence of children is an important factor in remarriage rates of women but not of men.

Childbearing Patterns

Children have always been a central part of American families. Yet in the last 30 years, norms and expectations have changed. Compared with the 1960s, childbearing has been delayed, family

Figure 7
Total Fertility Rate of U.S. Women, 1940-1989



Source: National Center for Health Statistics, *Advance Report of Final Natality Statistics, 1989.*

size has declined, and a larger portion of births are now occurring outside of marriage.

Family Size

American families at the start of the 19th century were both large and, for the most part, unplanned. Women typically had about seven children; not all survived to adulthood. By the start of the 20th century, the average number of children per woman dropped to about 3.6 and continued down to 2.1 by the mid-1930s.[40] Then came the post-World War II baby boom (1946 to 1964) with fertility rates as high as 3.7 births per woman (see Figure 7). By the mid-1970s, fertility had fallen below the replacement level of 2.1 children per woman—that is, couples were not having enough children to "replace" their numbers in the population. By 1989, the fertility rate had crept back up to near replacement level, sparking new speculation that Americans were returning to traditional family patterns.

A closer look at the data, however, suggests no single pattern of fertility behavior. As Figure 7 indicates, the fertility rates of African-American and white women have followed parallel courses, although African-American fertility has been at a higher level. Both groups experienced an increase in fertility rates during the baby boom of the 1950s and 1960s, and both groups saw a drop in rates during the 1970s and early 1980s. Although African-American fertility never fell below replacement level, the gap between black and white fertility narrowed. Since 1985, both groups have increased their fertility, but the increase has been twice as great for blacks as for whites.

Hispanics tend to have higher fertility than non-Hispanic whites, although the difference between Hispanics and non-Hispanic whites is not as great as between African-Americans and whites.

The growing proportion of minority women in their childbearing years has resulted in a growing number of minority births. Births to minority women in the United States accounted for one in five newborns in 1989, compared with one in seven in 1960.

Changes in fertility rates can be attributed to both the timing of births and changes in completed family size. During the 1950s, half of all women marrying for the first time were teenagers, and childbearing began soon after marriage. Half of the women who married between 1955 and 1964 had their first birth within 15 months of their wedding. During the 1970s, the average age at first marriage crept upward and childbearing began, on average, within 27 months of marriage.[41]

Although well over half (58 percent) of all births in 1989 were to women ages 20 to 29, an increasing share were born to women ages 30 and older. Nearly one in three births in 1989 was to an older mother.[42]

Increasing levels of education are in part responsible for this shift in timing of births. Among women ages 30 to 34 who were having their first child in 1989, 46 percent were college graduates, compared with 33 percent of women ages 25 to 29 and 7 percent of women ages 20 to 24. Young, well-educated women are delaying entry into motherhood, while their older counterparts are finally having the births that were postponed at younger ages.

Despite the current increase in fertility rates, a relatively high proportion of women today are likely to remain childless. Eighteen percent of women who were in their late-30s in 1990 did not have children, and another 18 percent reported only one child. The largest group (37 percent) had two children. In contrast, only 9 percent of women who were in their prime childbearing ages during the height of the baby boom were childless by the time they reached their late-30s, and 10 percent had only one child. Almost 60 percent of women in the baby-boom era had three or more children; less than 30 percent of women who are in their late-30s today have as many children.

Birth rates for third- and fourth-order births in 1989 rose slightly compared to 1980, but remain well below 1970 levels.[43] Although this trend suggests a possible increase in completed family size for younger cohorts of women in the years ahead, both men and women who are now under age 35 report that they intend to have 2.3 children on average.[44] The number of births expected is higher for Hispanics (around 3.1 births) than for African-Americans (about 2.9), and decreases as level of education increases.

Teenage Parents

Throughout the 1970s and early 1980s, both the number of births and the birth rate to women under age 20 fell steadily. By the late-1980s, however, there was a sharp upswing in teenage parenting. More than a half million births occurred to teenage mothers in 1989—13 percent of all births that year.

This upswing in births to teens was particularly sharp among younger teens. The birth rate for young women ages 15 to 17 rose 19 percent in just three years, increasing from 31 births per 1,000 women of this age group in 1986 to 37 births per 1,000 in 1989. For older teens (ages 18 to 19), the increase was only 6 percent—from 81 in 1986 to 86 in 1989. While these rates are still below the levels recorded 20 years earlier (that is, 39 for 15- to 17-year-olds and 115 for 18- to 19-year-olds in 1970), they nonetheless represent a reversal of a persistent move away from early parenting.

The rise in birth rates among women under age 20 is associated with the increasing proportions of teens who are sexually active. One-quarter of 15-year-old women and one-half of 17-year-old women were sexually active in 1988, according to the National Survey of Family Growth. These figures represent a 40 to 50 percent increase over similar data for 1980.[45] An increasing proportion of teenagers are clearly at risk of becoming pregnant. Because abortion rates for teenagers have remained steady during the 1980s, more pregnancies are carried to term.[46]

Teenage childbearing is not just an issue for minorities. About two-thirds of the births to teenage mothers in 1989 were to white teens. But minority teens are at greater risk of early parenthood. Birth rates for African-American teens in 1989, for example, were almost two and one-half times higher than for white

Kate Sharp

Thirteen percent of all births in 1989 were to teenage mothers.

Table 4

Birth Rates to Teens Ages 15-19 for Selected Countries, 1970-1989

Country	1970	1980	1985	1989
United States	68.3	53.0	51.3	58.1
Denmark	32.4	16.8	9.1	9.2
France	27.0	17.8	11.6	9.2
Germany (western)	35.8	15.2	8.6	11.1
Japan	5.0	7.6	9.0	9.8
Netherlands	17.0	6.8	5.0	5.9
United Kingdom	49.1	30.5	29.6	31.7

Source: Eurostat, *Demographic Statistics, 1991*; Japan Ministry of Health and Welfare; and U.S. National Center for Health Statistics, *Final Natality Statistics, 1989*.

teens—115 vs. 47 births per 1,000 teenage women. The birth rate for Hispanic teens was 58. Just over 60 percent of teenage mothers had not completed high school at the time of their child's birth. This does not mean that all of these young women are high school dropouts. Many eventually receive a high school diploma. But women who bear children in their teens are less likely to go on to (or complete) college than those who delay childbearing, and they are more likely to suffer long-term economic consequences because of their lower skill levels.[17]

The pattern of teenage childbearing observed in the United States over the

Box 2

Contraception and Abortion

Contraception is not new. At least 40 percent of U.S. women born in the 1840s practiced some form of birth control. But easy to use and highly effective modern contraceptive methods helped change sexual mores and practices.

Today, about 60 percent of U.S. women ages 15 to 44 use contraception.[1] Teenagers are least likely to do so. Only about one-third of sexually active teens used a method in 1988, up from one-quarter in 1982. In contrast, contraceptive use is highest among married women, whites, and women with more education and higher income.

The pill was the most common contraceptive method in 1988, used by 31 percent of women. However, female surgical sterilization (used by 28 percent), combined with male sterilization (which 12 percent rely on), is the most prevalent contraceptive method in the United States for couples who want no more children. About 15 percent of women rely on the male condom for contraception, 6 percent use the diaphragm, and 2 percent the IUD. Among teenagers, two-thirds use the pill and one-third rely on condoms for protection.

The current contraceptive mix could change, however. As baby boomers leave the childbearing ages, there could be a decrease in the percentage of women using the pill and other reversable methods and an increase in sterilization. The condom may become more widely used, not just to avoid pregnancy, but to prevent AIDS and other sexually transmitted diseases.

New contraceptive methods, such as the implant NORPLANT and the injectable Depo-Provera may introduce greater choice in the range of contraceptive methods available to U.S. women. But as these newer methods become more widely available, important social, legal, and ethical issues are being raised. How safe are these methods and what do we know about their long-term health risks? Should welfare mothers be required to use one of these new forms of contraception to prevent them from having additional children while on welfare? Does such a requirement violate a woman's right to privacy? Should contraceptives be distributed in school-based clinics?

Although questions about contraception present some thorny problems, nothing is more controversial and divisive as the issue of abortion. Since the passage of *Roe v. Wade* in 1973 which legalized abortion in the United States, the number of abortions has doubled from about 745,000 in 1973 to 1.6 milpast two decades is shared by many European countries (see Table 4). Fertility rates for teens in Denmark, Germany, France, the Netherlands, and the United Kingdom, for example, all dropped sharply between 1970 and 1980. Rates declined until around 1985 and then in all countries, except France, have edged slowly upward.

Although the general trends in teen parenting in Europe and the United States are similar, the levels of teen childbearing are not. The current birth rate to teens in the United States is five times higher than in many European countries. Although the rate of teen childbearing has dropped in all of these countries, the decline has been much slower in the United States, thereby widening the gap between the United States and other nations. In 1989, teen births accounted for 13 percent of all births in the United States. In France, Germany, and Denmark, they represented just 3 percent of births; in the United Kingdom, about 8 percent.[48]

Why is teen childbearing higher in the United States than in other industrialized countries? Studies cite a number of reasons.[49] For example, in the United States a higher proportion of women do not use any contraception, and a lower proportion use the most effective forms of contraception (see Box 2). Family-

The current birth rate to teens in the United States is five times higher than in many European countries.

lion in 1989. However, during this same period, the number of women of reproductive age also increased by roughly 40 percent. Although more abortions are being performed, there are also more women at risk of being pregnant.

Women who had abortions in 1987 were predominantly white (65 percent) and unmarried (82 percent), according to the Centers for Disease Control. Women ages 20 to 24 accounted for one-third of abortions, teenagers (ages 15 to 19) for one-fourth, and women ages 25 to 29 for about one-fifth of the abortions performed that year.

Access to abortion services in the United States is very uneven across counties. In 1989, 51 percent of metropolitan counties and 93 percent of nonmetropolitan counties had no provider. Abortion rates also vary widely by state. California, with 46 abortions per 1,000 women ages 15 to 44, had the highest rate; Wyoming had the lowest rate at 5 per 1,000. State policies on abortion, including public payment for abortion services for low-income women, are an important factor in explaining these differences.

The battle to reverse the *Roe v. Wade* decision is likely to take center stage in the national debate for the next few years. A majority of Americans (55 percent) in a 1992 public opinion poll said that they favored the *Roe v. Wade* decision.[2] But a majority (56 percent) also said that they favored putting some limits on the availability of abortion in their state, especially for teenagers under age 18. In early 1992, 35 states had laws requiring minors to inform their parents or obtain their consent to get an abortion.[3]

The June 1992 Supreme Court decision, *Casey v. Planned Parenthood*, gave states more latitude to legislate restrictions on abortion, stipulating that such restrictions not place an "undue burden" on women seeking abortion. This decision seems likely to increase differences in state laws concerning access to abortion. If the Court should overturn *Roe v. Wade*, differences between the states would widen further.

References

1. William D. Mosher, "Contraceptive Practice in the United States, 1982-1988," *Family Planning Perspectives* 22, no. 5 (September/October 1990): 198-205.
2. *Washington Post*, 1 July 1992.
3. National Abortion Rights League, *Who Decides? A State by State Review of Abortion Rights in America* (Washington, DC: National Abortion Rights League, 1992).

planning clinics, widely used in other countries, are often stigmatized in the United States because they primarily direct their services to low-income women. Information about sexuality and contraception is more widely available in many European countries than it is in the United States. Sex education courses in the schools and information in the media make young people more aware of the availability of contraception and the various contraceptive methods. These factors may also help explain the high abortion rates among U.S. teens. Teenagers accounted for 26 percent of abortions in the United States in 1988, compared with 17 percent in Denmark, 13 percent in the United Kingdom, and 12 percent in France.[50]

Births to Unmarried Mothers

Births to unmarried women of all ages increased from 224,000 in 1960 to over 1 million in 1989—nearly a fivefold increase in just three decades (see Figure 8). In 1960, only 5 percent of all births were to unmarried mothers; by 1989, the share had risen to 27 percent. The trend is driven primarily by women age 20 and older. In 1970, about half of the births to unmarried women were to women age 20 and older; by 1989, more than two-thirds were to women in this age group.

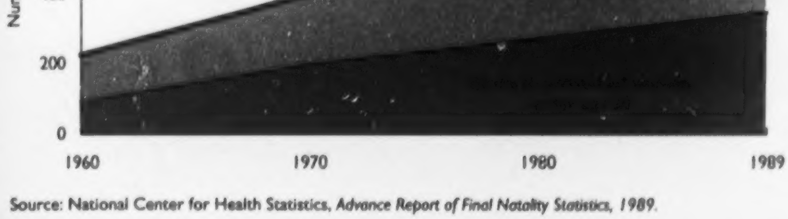
Nonmarital childbearing increased among all population groups, but is particularly prevalent among minority groups. Two of every three black infants were born to unmarried mothers in 1989 as were one of every three Hispanic infants. By comparison, one of every five white infants was born to an unmarried mother. The very large percentage of births to unmarried African-American women is the result of two trends: first, the steep drop in marriage rates for black women means that more African-American women are "at risk" of having an out-of-wedlock birth; and second, marital fertility rates have fallen much more rapidly than nonmarital rates among African-American women. With these trends working in tandem, the percentage of nonmarital births rose quickly. By 1976, more than half of all black children were born to mothers who were not married.

Although some observers are alarmed by the high percentage of births to unwed mothers in the United States, it is similar to the share found in Canada, France, the United Kingdom and other industrialized countries (see Table 5). Out-of-wedlock childbearing in Sweden is twice as high as that of the United States. In contrast, nonmarital childbearing in Japan is extremely low.

The rates of unmarried childbearing among teenage mothers have drawn particular attention in the United States. In just 20 years the rate has grown by over 80 percent. In 1970, there were 22 births per 1,000 unmarried teenage girls; by 1989, the rate was up to 41. Although black teens have much higher rates of unmarried motherhood than white teens (107 vs. 28 births per 1,000 unmarried teens in 1989), the rates for whites more than doubled between 1970 and 1989. In contrast, rates for blacks grew by only 10 percent.

Teens, like other age groups in the population, are delaying marriage—even if they become pregnant. Whereas over half of all births to women under age 20 between 1960 and 1964 occurred to women who were married at the time of conception, now less than

Figure 8
Births to Unmarried Women, 1960-1989



Source: National Center for Health Statistics, *Advance Report of Final Natality Statistics, 1989.*

Table 5

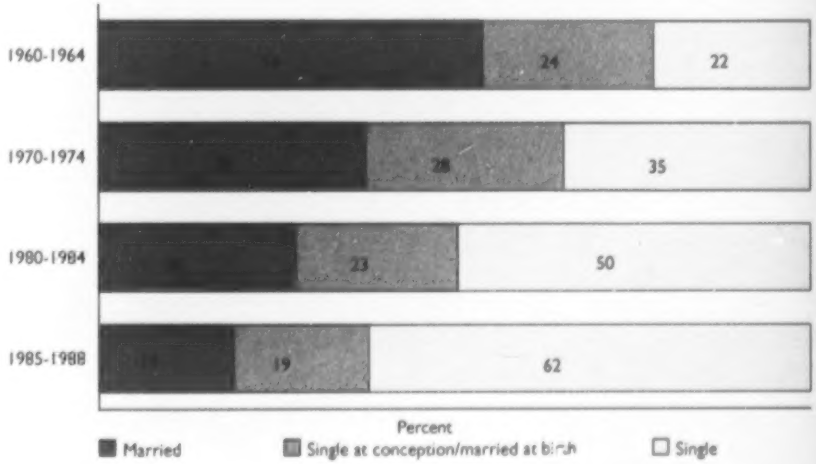
Percentage of Births to Unmarried Women for Selected Countries, 1960-1989

Country	Percent of all births 1960	1970	1980	1989
United States	5.3	10.7	18.4	27.1
Canada	4.3	9.6	12.8	23.0
France	6.1	6.8	11.4	28.2
Germany (western)	6.3	5.5	7.6	10.2
Japan	1.2	0.9	0.8	1.0
Sweden	11.3	18.4	39.7	51.8
United Kingdom	5.2	8.0	11.5	26.6

Source: *U.S. Statistical Abstract*, 1991, and country vital statistics reports.

Figure 9

Marital Status of Teen Mothers at Time of First Birth, 1960-1988



Source: U.S. Bureau of the Census, *Current Population Reports* P-20, no. 436 and Martin O'Connell and Carolyn C. Rogers, *Family Planning Perspectives* (July/August 1984).

20 percent of teen births are conceived within marriage (see Figure 9). The decision to marry after becoming pregnant has also declined—from 24 percent between 1960 and 1964 to 19 percent from 1985 to 1988. Today, over 60 percent of all births to teens occur outside of marriage—almost three times the rate of the early 1960s.

Only a small portion of unmarried childbearing occurs by choice. Two-thirds of never-married mothers reported that their pregnancy was unintended (that is, either mistimed or unwanted), compared with about one-third of married women.[51] About 20 percent of the births to women in poverty in the mid-1980s were unwanted at the time of conception, double the national average. It should be noted, however, that unwanted pregnancies do not necessarily yield unwanted or unloved children. Mothers who report an unwanted pregnancy may want and love the child that is born.

The deliberate choice to accept single parenthood has rapidly increased among never-married white women over the age of 24. These are baby-boom women who may be concerned that their prime childbearing years are passing them by. More than half (55 percent) of these never-married mothers reported in 1988 that they intended to conceive a child at the time of their pregnancy—up from just 16 percent in 1982. In contrast, only 44 percent of never-married black women ages 25 and older in 1988 had intended to get pregnant.

Although an increasing share of older, never-married women appear to be choosing single-parenthood, less than one in three births to never-married mothers occurs to women over the age of 24. Instead, about half of all births to never-married mothers were to women in their early 20s, nearly 70 percent of whom reported their pregnancy as either mistimed or unwanted at the time of conception.

Despite the increase in unmarried childbearing, social attitudes still tend to disapprove of the practice. More than one-third of non-Hispanic whites and over one-quarter of blacks and Hispanics said that they "strongly disapproved" of women who have a child out-of-wedlock.[52] But the proportion who "strongly disapprove" declined among younger age groups and among those with higher levels of education.

One further note: Not every child born to an unmarried mother begins life in a single-parent home. About one-quarter of all out-of-wedlock births are to two-parent (though unmarried) households.[53] Nonetheless, studies have shown that these relationships, like many marriages, can be quite fragile. About one-third of these cohabiting parents do not marry each other.

Adoption

While births to unmarried women increased during the 1980s, the number of children who were adopted decreased. Statistics on adoption are very scarce and tend to describe the characteristics of children and their adoptive families rather than assess the causes or consequences of adoption.

A very small share of ever-married women have adopted a child—just under 2 percent in 1987.[54] The vast majority (87 percent) of adoptive mothers are white; about 9 percent are African-American, and 3 percent Hispanic. Two-thirds of adoptive parents have more than a high school education and one-third had income above $35,000 in 1987. Interracial adoptions constituted about 8 percent of all adoptions and primarily consisted of white mothers and an Asian or other nonblack child.

Infants are more likely to be adopted than older children. Almost three-quarters of adoptions in 1987 were children under age 1. Children age 6 and older accounted for about 10 percent of adoptions that year.

In short, the picture we have of adoption is incomplete and not very detailed. Most data are from state child welfare agencies and do not provide a broad overview of the process, the children, or the families that are involved in adoption. As the structure of American families changes, there is a growing need for better information on this mechanism that provides care for children whose biological parents are unable to care for them.

Michael Siluk

Many employed mothers find creative ways to juggle job and child-care duties.

New Paths to Parenthood

Medical technology has created new paths to parenthood for infertile couples and for a new group of would-be parents: women who want children, but either do not have a male partner or do not desire one. Technological paths to parenthood are numerous and include artificial insemination, surrogate motherhood, *in vitro* fertilization of an egg outside the body, interfollicular insemination (that is, injection of sperm directly into the ovary next to a ripened egg), and others. Some procedures, such as *in vitro* fertilization, carry a high price tag—$5,000 or more per attempt. The average cost of diagnostic and medical treatment for infertility in 1988 was over $2,500 per couple, according to the Office of Technology Assessment.

The new fertility techniques, some of which have made headlines in recent years, raise new legal and ethical questions concerning the meaning of parenthood. Should health insurance companies be required to cover infertility treatment? Who controls the frozen eggs or embryos in case a couple disagrees or divorces? Who decides on the disposal of unused fertilized embryos? Do surrogate mothers have parental rights? Do the children of implant procedures have the right to know who their biological parents are? Such questions will challenge not only legal scholars but also our concepts of parenthood and family structure as we head toward the next century.

The Changing Roles of Family Members

Within the family we are called on to play many roles: husbands, wives, mothers, fathers, children, siblings, aunts, uncles, cousins, grandparents. But family roles are changing along with family structures. Increasingly, wives and mothers help bring in income. Husbands and fathers take on some of the traditional housework roles and have increased (albeit modestly) the time they spend caring for children. Yet these social changes are happening so quickly that many people who grew up in the traditional family framework now find themselves psychologically unprepared (or at least, confused) as changing times rewrite their family job descriptions.

Working women, for example, have found they must become skilled jugglers of conflicting demands on their time and energy. Roles seem particularly untested in the stepfamilies or blended families that have become more prevalent as a result of more widespread divorce and remarriage. Demographer Andrew Cherlin characterizes the stepfamily as an "incomplete institution" which lacks "guidelines for role performance, institutionalized procedures for dealing with problems, and social support." Stepparents have a "limited license to parent." Typically they must defer to the authority of the natural parent and become "skilled diplomats" and negotiators.[55]

Roles of Women

Fundamental changes have occurred in the lives of American women. Their options and opportunities for pursuing a career or having a family are much more diverse than 30 years ago. How women fill these roles has become an integral part of the restructuring of the American family.

Women as Breadwinners

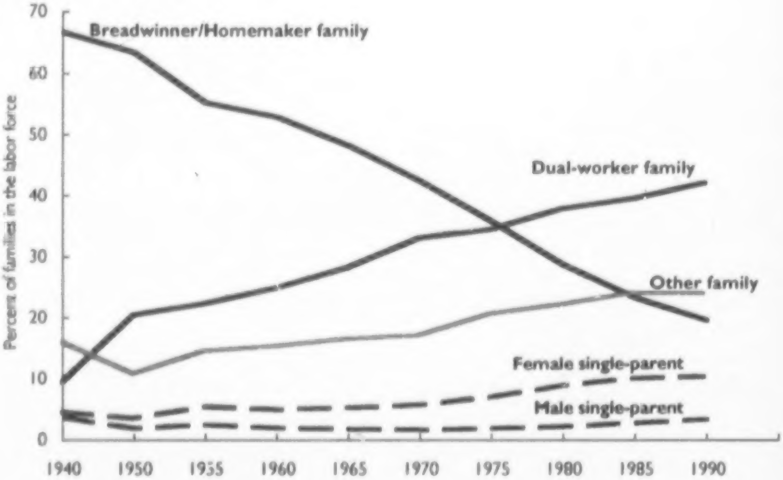
Breadwinning has increasingly become a shared responsibility in married-couple households. This is a long-term trend, as Figure 10 shows. Between 1940 and 1990 the proportion of breadwinner-homemaker families fell from nearly 70 percent to about 20 percent. During the same period, the share of dual-worker families increased from about one in ten to four in ten. Dual-worker families are now the dominant family model among workers in the labor force.

Earnings of women play an important part in family income. The median annual income of married-couple families in which the wife worked was about $47,000 in 1990, compared with $30,000 where the wife did not work. The median income of a female-headed family was $17,000.[56]

More than half (57 percent) of women ages 16 and older were in the labor force in 1991. This represents a big jump over 1960 (38 percent), although the rate appears to have leveled off in the late 1980s.[57] In 1991, more than half (58 percent) of mothers with children under the age of six were in the labor force, about two-thirds of these women were employed full-time. In 1960, only one in five mothers with preschool age children worked outside the home. By

Figure 10

Families in the Labor Force, 1940-1990



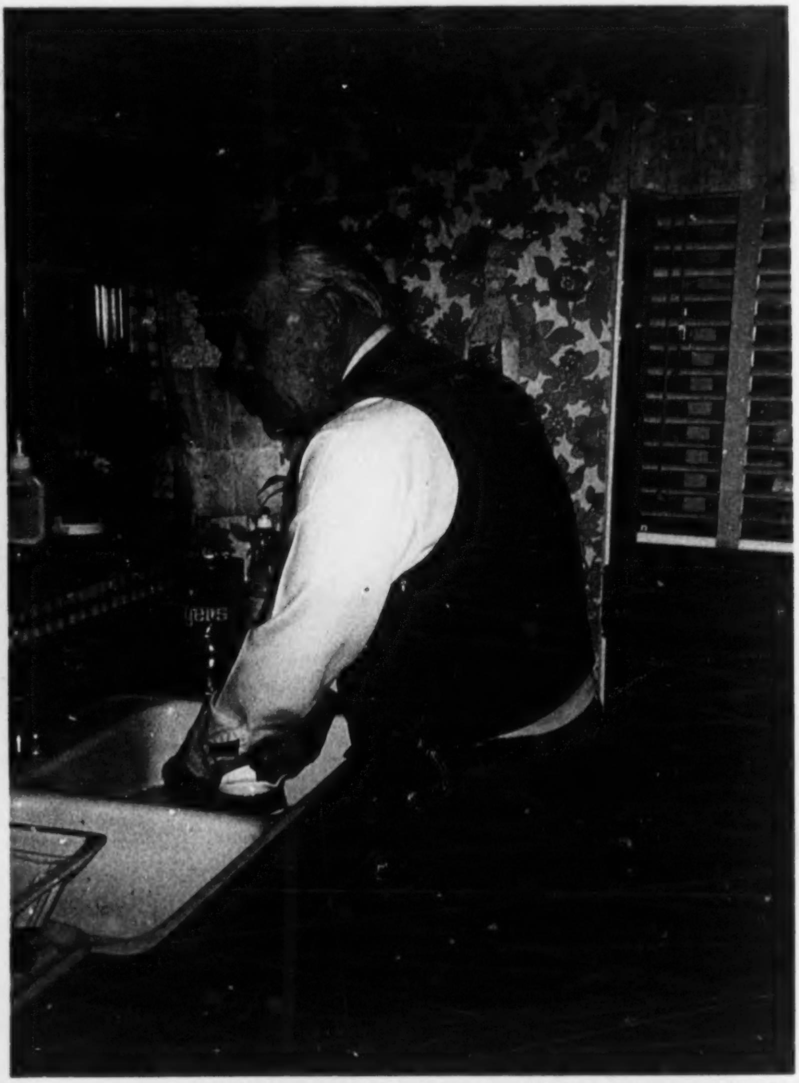
Source: Howard Hayghe, *Monthly Labor Review* (March 1990).

Table 6

Mothers in the Labor Force for Selected Countries, 1988

Country	Percentage of mothers in the labor force with children Under age 18	Under age 3
United States	65	53
Canada	67*	58
Denmark	86	84
Germany (western)	48	40
France	66	60
Italy	44	45
Sweden	89*	86**
United Kingdom	59	37

* Children under 16 years
** Children under 7 years
Note: Data for United States, Canada, and Sweden are for 1988; data for other countries are for 1986.
Source: Constance Sorrentino, *Monthly Labor Review* (March 1990).



Carol De Vita

Coping with household tasks can be a challenge for older men who are widowed.

1995, a projected two-thirds of preschool-age children and three-fourths of school-age children will have mothers who are employed outside the home.[58] These demographic trends will continue to underscore the need for flexible work hours and parental leave policies.

Mothers work because of economic necessity, to better the family income, or to fulfill career goals. However, most observers agree that trying to balance competing demands of a job and family responsibilities can be stressful. Only about one in three mothers who worked 35 to 40 hours per week reported feeling they had the "right amount of time" with their family.[59]

The proportion of U.S. mothers who work outside the home is comparable to mothers in other developed countries (see Table 6). In the late 1980s, about two-thirds of U.S. women with children under age 18 were in the labor force, about the same as in Canada (67 percent) and France (66 percent), but above the proportions in the United Kingdom (59 percent) and Germany (48 percent). U.S. rates, however, are well below those in Denmark (86 percent) and Sweden (89 percent).

Who Does the Housework?

As women increasingly share the role of breadwinner for their families, what has happened to the unpaid work of keeping the home going? Demographers Frances Goldscheider and Linda Waite have examined how wives, husbands, and children in the United States share household tasks. They found that husbands make significant contributions to household tasks and that children also tend to contribute to the running of the household, but that women continue to carry the bulk of the responsibility.[60] Mothers in two-parent families reported that their share of the laundry, shopping, and cooking was around 80 percent. They also did about two-thirds of the housecleaning, dishwashing, child care, and family paperwork (see Figure 11). The only task in which women assume less than half of the responsibility is in performing yard work and household maintenance. As Figure 11 also shows, husbands do more work than children, and very little of the work is performed by people outside the immediate family. Hiring outside help is used in only a small percentage of cases and only for a few tasks.

Husbands and children tend to substitute for one another in performing household tasks, or "alternate in the role of chief helper" as Goldscheider and Waite put it. For example, the presence of a teenage daughter tends to lessen the workload of the father. The responsibility of the wife, however, remains about the same. Overall, the typical division of labor remains fairly traditional, with the wife responsible for most home-based tasks. In addition, traditional gender roles are evident in jobs allocated to children, with girls taking on more responsibility than boys. When wives have a fairly well-paid job (earning more than $25,000 per year), husbands and children both increased their share of household chores.

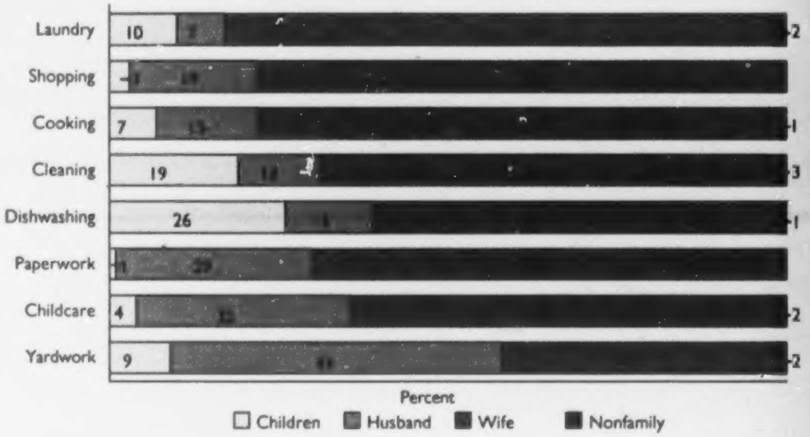
As might be expected, household work patterns vary by family structure. Children in mother-only families take on a greater share of household work, and this pattern tends to carry over even after the mother remarries, lessening the share of stepfathers. It seems that experience in nontraditional family structures—either spending part of one's childhood in a mother-only family or stepfamily, living in a nonfamily household as a young adult, or going through a divorce and remarriage—increases the tendency of a woman to share the housework with husband and children. This is especially true for younger women; older wives, socialized in an earlier era, are more likely to try to do both traditional household tasks as well as their paid job.

Roles of Men

Under the breadwinner-homemaker family model, men were expected to shoulder responsibility for the financial well-being of the family, resolve major family problems or disputes, and provide a strong role model for other family members, especially for young boys. But as family structures have changed, so too have the roles that men are expected to assume.

Figure 11

Distribution of Household Tasks by Family Members, mid-1980s



Source: Goldscheider and Waite, *New Families, No Families?*, 1991, using National Longitudinal Surveys of Young Women and Mature Women.

The Good Provider and Nurturer

Being a good provider is still regarded as one of the central roles that men are expected to perform. If no longer the sole breadwinner in the family, most men continue to provide the largest source of income—on average about two-thirds of total family income. Part of the reason for this difference in annual earnings is that men tend to increase their hours at work when they become parents, while women decrease theirs.[61] It is well known that children in a mother-only family are more at risk of living in poverty than other children. About half of all children who are poor in the United States currently live in mother-only families.

But being a good provider is increasingly viewed as not enough. Men are expected to be sensitive, nurturing, and caring. As demographer Frank Furstenberg writes, "fatherhood is in vogue....Television, magazines, and movies herald the coming of the modern father—the nurturant, caring, and emotionally attuned parent....Today's father is at least as adept at changing diapers as changing tires."[62]

Popular images aside, Furstenberg concludes that "modest change has occurred in both the attitude and the behavior of fathers" toward personal involvement in child care and parenting. For example, the father is the primary child-care provider in 15 percent of families with children under age 5 in which the mother is employed. But grandparents also account for 15 percent of primary care providers and other relatives about 10 percent.[63]

Absent Fathers

Yet, despite the advent of a new role model for fathers, a large minority of U.S. children do not see much of their fathers at all. Family scholars point to an erosion of the cultural norm that fathers live with and financially support their biological children. Instead, a new pattern of fatherhood (sometimes called "serial parenting") is emerging where men live with, support, and play an active parental role with the children of the woman they are currently married to or living with. Often contact with their children from a previous union diminishes over time.

According to the National Survey of Children, only about one-third of all children living apart from their father saw their dad as often as every week; about one-fifth had not seen their father in the previous year, and another one-fifth had not seen him in five years. Contact appears to decline rapidly within one to two years after divorce.[64] Census Bureau figures show that about one-fourth of noncustodial fathers live in a different state than their children and another one-tenth of custodial mothers did not know in which state the father resided.[65]

Despite this lack of contact, the majority of noncustodial fathers (55 percent) had visitation privileges in 1990.[66] Many noncustodial dads complain, however, that their ex-wife thwarts their attempts to see their children. The inability of divorced or separated couples to resolve their differences may deny children access to the noncustodial parent. A small share of fathers (7 percent) had joint custody of their children, an arrangement that presumably encourages greater contact between father and child, although evidence on this point is scant.

Michael Siluk

Fathers are the primary child-care provider in 15 percent of dual-earner families.

Kate Sharp

The new image of fathers is that of a caring and nurturing dad.

Never-married women are one-third less likely than divorced women to be awarded child support, but both groups have about the same chance of receiving payment.

Child Support

Many fathers repudiate their role as breadwinner for their child after divorce or separation from the child's mother. Of the 10 million women in 1990 who were divorced, separated, or never-married mothers and who had children under the age of 21, over half (58 percent) had been awarded child support payments. Only half of this group, however, actually received full payments. The remaining half was about equally divided between those who received partial payment and those who received nothing. Never-married women are one-third less likely than divorced women to be awarded child support, but both groups have about the same chance of receiving payment.[67] The average amount of child support actually received was just under $3,000, which accounted for about one-fifth (19 percent) of total family income.

A number of laws have been enacted by Congress to improve the collection of child support payments. The Omnibus Reconciliation Act of 1981, for example, authorized the IRS to withhold federal income tax refunds from individuals seriously delinquent in child support payments. The Child Support Amendment of 1984, required employers to withhold child support from the paychecks of parents who fell behind in payments, and the Family Support Act of 1988 established state guidelines for determining child support obligations and increased enforcement.

Will better enforcement of child support payments place an unfair burden on the noncustodial parent, 90 percent of whom are fathers? According to a recent study, the answer is no. The study estimated that noncustodial fathers could pay about two-and-one-half times their current legal obligations and more than three times what they are actually paying.[68]

Would better enforcement of child support laws keep some children out of poverty and lower welfare dependency? The answer to this question is maybe, in some instances, but better child support enforcement will not fully resolve the problems of women and children in poverty or on welfare. Studies suggest that although increased enforcement of child support payments would decrease the cost of welfare, it would do little to decrease AFDC dependence or poverty because the legally awarded amounts of child support are low, particularly for women on welfare.[69]

Since the new child support legislation was enacted, there has been some improvement in compliance.[70] Specifically, payment through the courts, wage withholding, and increased spending on enforcement procedures have increased the probability that child support payments will be received, as well as the amount received. Friendly relations between parents and frequent contact between the noncustodial parent and the child also increased payment.

Although most children can count on living with their mothers throughout their childhoods, the presence of a father (or father figure) is much less predictable.

Children

Changing family patterns have had a big impact on the lives of children. Furstenberg and Cherlin sum up the situation for children as follows: "...compared with the 1950s and even with the early decades of this century family life has become more variable and less predictable for children. Whatever the advantages of the new marriage system for parents, it has introduced a great deal of uncertainty in the family lives of children."[71]

Although most children can count on living with their mothers throughout their childhoods, the presence of a father (or father figure) is much less predictable. One in five white children, one in three Hispanic children, and half of African-American children lived in mother-only homes in 1991. Uncertainty about a two-parent family means more uncertainty about stability of family income through childhood, a factor that contributes to the high incidence of poverty among children.

From a psychological perspective, children are expected to cope with family flux, ambiguous relationships with mother's new partner, and the "thinner form of kinship" that results from the new family arrangements. "This thinner form of kinship may not be an adequate substitute for the loss of relatives who had a stronger stake in the child's success. Through divorce and remarriage, individuals are related to more and more people, to each of whom they owe less and less."[72]

Although the transition to new family patterns may be most acute for children in divorced, separated, or blended families, even those in stable, intact families face new adjustments. Use of out-of-home child-care programs for preschool children, for example, has increased steadily over the past 25 years, and older children are expected to assume more independent roles.

Child-Care Arrangements for Young Children

In 1988, 13.3 million children ages 5 and younger were in some type of nonmaternal child-care arrangement in the United States. Of these, 83 percent had mothers who were employed outside the home. But regular use of nonmaternal child care is not limited to mothers in the labor force. More than one-third of full-time homemakers had either used or were currently using some type of child care. Indeed, the use of child care is so prevalent that over two-thirds of children ages 5 and younger have been in child care at some point in their lives—56 percent of children ages 2 and younger and 80 percent of those ages 4 and 5.[73]

Socialization and early childhood education away from parents and the family home have become a common part of children's lives. Children from higher income families, as well as children whose mother works outside the home, are most likely to be in child care. Although white children are somewhat more likely than minority children to be in child care, over half of African-American and Hispanic children are currently in child care.

Child-care arrangements differ, however, by age of child and employment status of the mother.[74] For families with a preschool-age child and a mother who is employed full-time, center-based care is the most common arrangement. One in three families use this type of care for their primary care arrangement. The second most prevalent arrangement is family day care (that is, care in someone else's home), used by 24 percent of mothers who are employed full-time. Juggling work schedules and child care is the dominant pattern for families with mothers who are employed part-time. Forty-four percent reported that parents provided the primary source of care, most likely through working different shifts. Child-care centers were the second most common arrangement, used by one in five families with mothers who are employed part-time. Only in the case of full-time homemakers does parental care represent the majority of care. Nonetheless, one-third of full-time homemakers use center-based or other out-of-home care as their primary child-care arrangement.

The effects of these arrangements on a child's physical, social, and cognitive development are just beginning to be explored. Child-care settings outside the child's own home and family were traditionally viewed as inferior. Recent studies, however, have documented that high quality child-care programs can provide important benefits to young children in terms of language and social development.[75] The key, however, is to provide quality care, and the challenge of the 1990s for both parents and public policymakers is to see that all children have the opportunity and option of participating in high quality child-care programs.

Older Children

Child-care needs assume a different pattern when children reach school age. Supervision after school is the primary concern. In two out of five families with children ages 5 to 12, a parent assumes this task; lessons, sports, or after-school activities were the primary care arrangement in one in five families.[76] The proportion of children who take care of themselves after school—that is, latchkey children—ranged from 3 percent for children ages 5 to 7 to 40 percent by age 12.

Older siblings play a very important role in the transition between adult supervised care and self care. The transition begins around ages 9 and 10 when older siblings are sometimes called on to "look after" their younger brothers or sisters, according to a national study.[77] Nearly two-thirds (65 percent) of the older siblings were teenagers, and more than one-fourth (27 percent) were ages 11 to 12. No child under age 9 was reported to be a caregiver for younger siblings. Parents overwhelmingly cited the child's maturity as the single most important factor in deciding to allow either self care or sibling care.

Michael Siluk

Grandparents sometimes assume an active role in helping to raise grandchildren.

Children in their teens have experienced a growing independence, and many have gained new financial muscle. A majority of older teens hold paying jobs. In the summer of 1991, 43 percent of 16- and 17-year-olds were working part-time and 9 percent held full-time jobs.[78] An even greater share of 18- and 19-year-olds worked: 45 percent part-time and 35 percent full-time. Workforce participation is high even during the school year. In January 1992, 39 percent of 16- and 17-year-olds, most of whom were enrolled in school, were holding down part-time jobs.

It is not clear to what extent employment affects the school achievement of these teens. A study of college students found that working less than 25 hours per week did not adversely affect grades, but increased the probability of not graduating within four years or dropping out of school.[79]

What is clear is that teens represent a substantial share of the consumer market. Teenagers spent $55 billion of their own money plus $27 billion of their families' money in 1991, reported *American Demographics* magazine.[80] Only about one in five employed teens contributes more than 20 percent of his or her earnings to family living expenses.

Families shoulder a major share of the responsibility for intergenerational support and assistance

Grandparents

The role of grandparents is also in transition. Gains in life expectancy have meant that more older people are living to experience grandparenthood and even great-grandparenthood. But the trend toward nuclear family households and independent living obscures the importance of extended family ties. Most older people prefer to maintain their own household rather than move in with adult children. Intimacy-at-a-distance (even if that "distance" is only across the street) is the preferred pattern of family relations. Yet the role of grandparent can assume many forms—an emotional buffer in times of crisis; an arbitrator for family squabbles; a caregiver and provider for those in need; or a bridge between past and current generations.[81]

Cherlin and Furstenberg, who interviewed grandparents of children in the National Survey of Children, described three main grandparenting styles: 1) more than half (55 percent) became "specialists in recreational caregiving" to their grandchildren (that is, enriching their grandchildren's lives through outings and other special activities); 2) more than one-fourth (29 percent) carried on a "ritualistic," primarily symbolic relationship with their grandchildren, sometimes a result of living far away from them; and 3) about one-sixth (16 percent) were actively involved with everyday routine care of their grandchildren, exercising substantial authority over them.

Divorce tends to increase interaction with the custodial parent's side of the family, generally the mother's parents and relations.[82] Maternal grandparents of children of divorce are more likely to live with the grandchild or to see that child almost every day. Grandparents may provide financial support or engage in parentlike behavior. Children of divorce often lose contact with their paternal grandparents. In fact, some grandparents have gone to court to obtain the legal right to visit their grandchild after the child's parents divorce.

Intergenerational Ties

Our measures of family life and family responsibilities are generally centered around the nuclear family. But family ties extend beyond the immediate household and play a crucial role in how the family functions. Individuals often seek or receive help from other family members at crucial turning points in life such as after a divorce, during the purchase of a first home, or when failing health demands care. A better understanding of the mutual supports and intergenerational dependencies that shape a family will be an important part of public policymaking in the years ahead.

Intergenerational transfers are a complex flow of resources consisting of a mix of private and public resources. Some public programs, such as Social Security, transfer resources from the younger to the older generation. Education, on the other hand, represents a transfer of resources from the older to the younger generation. Children's services are funded primarily by parents and at state and local levels of government. Most elderly services are funded through federal government programs and the personal resources of older people and their families. Families share resources through direct loans, gifts, bequests, or coresidence; or they may trade services such as cooking, cleaning, grocery shopping, child or elder care. The geographical distance between family members helps, in part, to determine the type of assistance given by family members.

Given this complex web of resource transfers, it is extremely difficult to measure whether the predominant flow of resources is from the older to the younger generation or the reverse. British economist John Ermisch notes that the direction of net transfers depends on the particular institutions, government programs, customs, and individual behaviors of a population. But the age distribution of the population also has an important influence. As the population ages, as is happening in the United States and other industrialized countries, net transfers from the younger to the older generation represent a bigger share of the flow.[83]

Families shoulder a major share of the responsibility for intergenerational support and assistance—and do so at every stage of the life cycle. A nationally representative study of young women between 1968 and 1984 found that as these women made the transition from youth to adulthood, the percent who received assistance from their parents declined, but at every age, parental aid always exceeded governmental aid. Sharing a residence was the most common form of assistance.[84] A similar study of young men found the same relationship for whites, but government aid was more important than family aid for young black men.[85]

Among older disabled persons who live in the community, over 90 percent relied, at least in part, on family and friends for care; 70 percent did so exclusively.[86] Adult daughters (or daughters-in-law) generally assume the caregiver role if the older person's spouse is un-

Stephen Tordella

Although most Americans live in nuclear families, they maintain contact with a substantial network of kin.

available. But women's increased labor-force participation has left little time for family caregiving. Forty-four percent of adult daughters who care for an impaired parent are employed; another 12 percent reported that they quit their job to provide care to an older person.[87] As the baby-boom generation enters middle age, it will face the twin demands of support and care of its children as well as aging parents. The demands and trade-offs of this arrangement will be faced by millions of baby boomers in the decade ahead.

Economic Well-Being of Families

The struggle to provide a decent standard of living for oneself and one's children is an experience shared by all families. Yet 33.6 million Americans—13.5 percent of the population—were living in poverty in 1990 according to government statistics.

Income and wealth have grown over the past 20 years, but so has the number of persons in poverty. Signs of distress, such as homeless families, have become increasingly visible (see Box 3). Debate flourishes on whether or not we are winning the war on poverty and whether families are being closed out of a middle-class lifestyle. One of the problems in this debate is that there is no general agreement on how best to measure economic well-being. Each side can, therefore, point to some evidence to support its position. What is the current economic status of families and what do we know about the well-being of families?

Median Income of Families

Median family income in 1990 was $35,400—half of all families have income above this level; half are below. This figure, however, conceals important differences by racial and ethnic group and by type of family (see Table 7). White families, no matter what their structure, fare considerably better than their minority counterparts. Family structure, however, is also an important factor in determining economic status.

For every racial and ethnic group, married couples report the highest median income, ranging from $40,300 for white couples to $28,000 for Hispanic couples. The potential for having two earners in the household increases the likelihood of achieving higher income levels. In all but Hispanic households, married couples with children report a somewhat higher median income than couples without children. Nonetheless, on an income-per-person basis, families without children fare better than those with children.

Table 7
Median Annual Income of U.S. Families and Households, 1990

Type of Family/Household	All	White	Black	Hispanic
All families	$35,400	$36,900	$21,400	$23,400
Married couples	39,900	40,300	33,800	28,000
No children	38,300	38,700	30,100	30,200
With children	41,300	41,700	35,700	27,500
Female-headed	17,000	19,500	12,100	11,900
No children	27,000	28,900	21,300	22,300
With children	13,100	14,900	10,300	10,100
Elderly (age 65+) household				
Married couple	25,500	26,100	17,200	18,800
Male alone	12,900	13,400	7,200	9,700
Female alone	9,500	9,900	5,600	6,300

Source: U.S. Bureau of the Census, *Current Population Reports* P-60, no. 174, and custom tabulations by Decision Demographics.

Box 3

Homeless Families

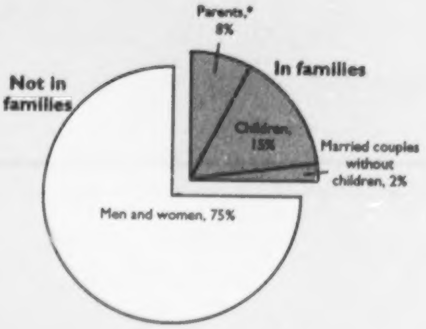
Although the vast majority of homeless people are individuals who live alone or in nonfamily settings, service providers have noted an increase in homeless families seeking assistance in shelters and soup kitchens. How many homeless families are there?

According to a 1987 study by Martha Burt of The Urban Institute, one-quarter of homeless individuals are in family units: 15 percent are children, 8 percent are their parents (overwhelmingly single mothers), and 2 percent are married couples with no children. (See figure.) Homeless parents are accompanied on average by two children. Given an estimate of between 500,000 and 600,000 homeless individuals on any given night, between 125,000 and 150,000 people would be members of a homeless family. The number of families that experience homelessness over a year, however, is much greater than these "snapshot" figures would indicate because of short-term or sporadic episodes of homelessness. On average, a homeless mother and her children have spent 16 months as a homeless family.

Homeless families tend to be extremely poor. Mothers in the study reported a mean income of just $121 per month in 1987, far less than the $763 per month used as the federal poverty standard for a single mother with two children in that same year. Relatively few homeless families receive income from government programs. One-third of the mothers received AFDC; another one-third, General Assistance. One-sixth of the women worked, and about half received food stamps during the previous month.

There are many causes of homelessness. During the 1980s, there was a squeeze on moderate and low-cost housing. Recessionary conditions and structural changes in the types of jobs available put some people out of work and made it more difficult for them to find re-employment. Domestic violence forced some women to leave home with their children.

Homeless Population by Family Status in the 1980s



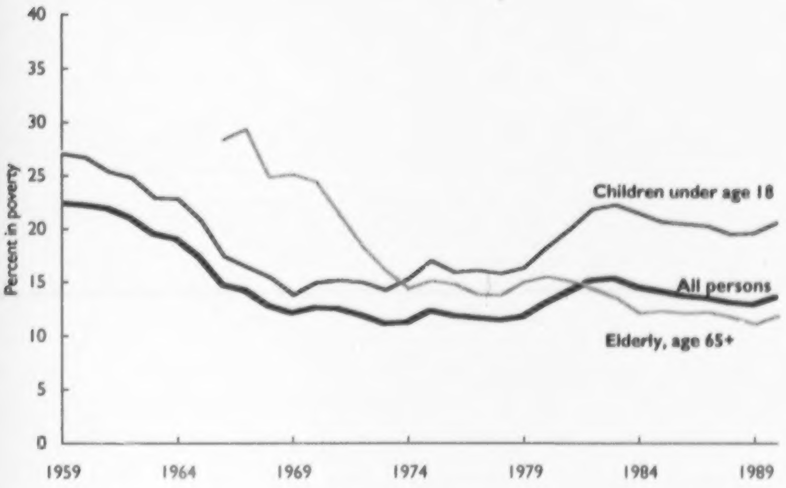
*Most are mothers
Source: Martha R. Burt, *Over the Edge: the Growth of Homelessness in the 1980s*. New York: Russell Sage Foundation, 1992.

By the time they become homeless, most homeless families have spent periods in the "'broken circle' of kith and kin networks."[1] Or, as Burt writes: "They may borrow money, leave bills unpaid, double up with other families or with friends, split up a household (for example, leaving older children with relatives), leave town to look for work, and use free services such as soup kitchens or health clinics to stretch their resources. Research indicates that currently homeless people have tried most or all of these approaches while they still had homes. Even with all of these strategies, however, they [were] not able to afford to stay in housing."[2]

References

1. James D. Wright, *Address Unknown: the Homeless in America* (New York: Aldine de Gruyter, 1989).
2. Martha R. Burt, *Over the Edge: The Growth of Homelessness in the 1980s* (New York: Russell Sage Foundation, 1992).

Figure 12
U.S. Poverty Rates, 1959-1990



Source: U.S. Bureau of the Census, *Current Population Reports* P-60, no. 175.

Median income for female-headed families was less than half the amount for married-couple families—$17,000 vs. $39,900. The greatest difference, however, was between single mothers and married couples with children. The median income for married couples with children was three times more than for a single woman with children—$41,300 vs. $13,100. This three-to-one ratio holds consistently across all racial and ethnic groups.

Households headed by older persons are a special situation. Because the vast majority of persons age 65 and older are no longer in the labor force, their income levels typically drop upon retirement. For elderly married couples, median income in 1990 was $25,500—about two-thirds the amount of all married-couple families. For black elderly married couples, the reduction was even greater—about half. However, once the married-couple dyad is broken (usually as a result of widowhood), the median income for older persons drops dramatically. Median income for an older person who lived alone in 1990 was $10,000—an income level that is even below that of a single mother with children. Marital status not only influences income levels of the population under age 65, it also plays a significant role in the population over 65.

Poverty Rates

Over the past 20 years, both the number and proportion of families in poverty have grown. In 1970, 5.3 million families (or 10 percent of all families) lived in poverty; by 1990, 7.1 million (or 11 percent) were classified as poor. Poverty rates dropped during the early-1970s, fluctuated in the 9 percent range during the mid-1970s, and climbed to over 12 percent by 1983. Both the number of families in poverty and the poverty rate for families declined steadily during the mid- and late-1980s, but both rose in 1990.

Changing economic conditions affect the year-to-year poverty rate, but demographic changes influence the number and characteristics of people in poverty. Whereas elderly persons once had the highest rate of poverty, children are most likely to be poor today (see Figure 12). In 1959, one in three older persons was living in poverty; today, the figure is one in eight. The Social Security system that is indexed to keep up with inflation has played a major role in this reduction.[88] In contrast, the proportion of children in poverty has declined only from one in four to one in five.

Both marital disruption and unmarried childbearing have kept child poverty rates high. The gradual increase in mother-only families has meant a steady rise in the proportion of children who live in poverty. By 1989, over half (57 percent) of all poor children lived in fatherless families, compared with less than one-quarter (24 percent) of their counterparts in 1959.[89]

Some analysts contend that the growth of welfare programs since the mid-1960s has contributed to the increase in single-parent homes and the number of children living in poverty. Research on the links between welfare, marriage, and childbearing, however, provide little support for this argument.[90] Among studies that find any association, the effect of welfare is small and does not greatly influence the overall level of marriage or fertility.

Other analysts contend that structural changes in the U.S. economy have been a major factor in the rise of child poverty rates. The stagnation in men's wages that began in the 1970s and the proliferation of part-time and temporary jobs in the 1980s added to the difficulties of families trying to make ends meet. Well-paying manufacturing jobs on which an individual can support a family have declined in number as technological advances and competition from abroad have grown.

The fastest growing segment of the labor market since 1980 has been in part-time and temporary employment. Although many people want part-time work, those who must raise a family or have no other means of support may find that these jobs offer limited security and unsteady wages. Not all part-time or temporary jobs are low-skilled or low-paying, but they generally do not offer fringe benefits, such as health insurance or paid sick leave. Nearly one-third of the nonelderly population who lacked health insurance coverage in 1991 were in families headed by a part-time or part-year worker.[91]

Rapid technological change has also meant that people without specialized skills have fewer opportunities for well-paying jobs. As employment centers shifted from the cities to the suburbs, urban minority groups have been left isolated from the new job markets. Sociologist William J. Wilson argues that the declining job prospects for black men have discouraged the formation of black married-couple families, fueling the increase in mother-only families that are most vulnerable to poverty.[92]

Demographic factors are interwoven with economic factors, however. Entry of the large baby-boom generation into the job market in the 1970s and early 1980s increased the supply of labor and depressed wages. Erratic oil prices and lack of growth in economic productivity prevented wages from rising in inflation-adjusted terms.[93] Couples responded to these changing economic conditions by having fewer children and by more women entering the work force. Economist Richard Easterlin has shown that if the labor force participation rate of wives had remained at its 1968 level, real family income would have fallen by about 8 percent between 1968 and 1982.[94]

Income Inequality

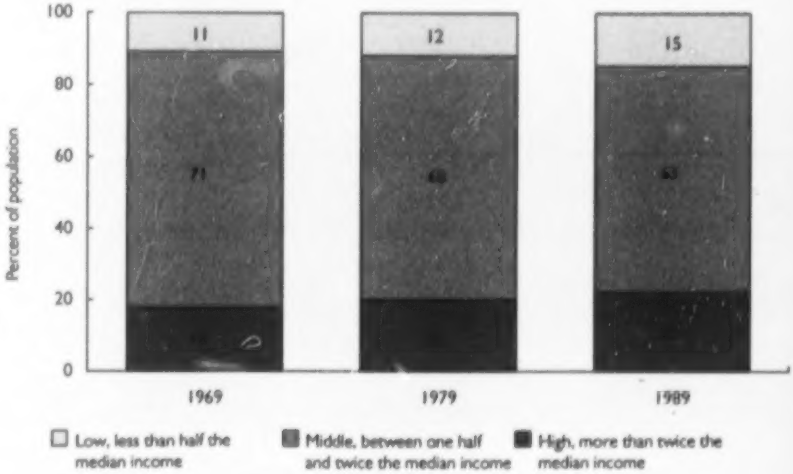
As family structure changes, questions arise about the vitality of the American middle-class. How are middle-class families coping? Is the middle class vanishing? Will future generations of young Americans be able to enjoy the same standard of living as their parents?

Between 1969 and 1989, the distribution of income in the United States was marked by an increase in overall inequality. There is a larger share of people in the lowest income levels as well as a larger share in the highest income levels (see Figure 13). The proportion of people in the middle class fell by 8 percentage points. By 1989, one in five individuals was in the lowest tier—that is, they had incomes less than one-half of the 1989 median income (or less than $15,000 in 1989). In contrast, 15 percent had incomes in the highest tier—an equivalent of twice the median income in 1989 (or roughly $60,000 or greater).

Education, race/ethnicity, and family structure play important roles. Individuals without a high school diploma showed a marked decline in relative income status; those with a college degree were more likely to be in the higher tier. Minorities were twice as

Figure 13

Percent of Persons with High, Middle, or Low Relative Income, 1969-1989



Source: U.S. Bureau of the Census, *Current Population Reports* P-60, no. 177.

Errata

New Realities of the American Family

Population Bulletin, vol. 47, no. 2 (August 1992)

In Figure 13, page 37, the labels for high and low relative income were reversed. The lightest shade of green represents the percentage of the population with high relative income (more than twice the median income) and the darkest shade represents those with low relative income (less than half the median income).

likely as whites to have low relative incomes, but three times less likely to be in the high income tier. Roughly 40 percent of African-Americans and Hispanics fell on the bottom rung of the relative income ladder, while only about 5 percent had made it to the top.

For young children (under age 6) not living in a married-couple family, the likelihood of having a low relative income was extremely high, regardless of race or ethnicity. In 1989, 66 percent of young white children and 80 percent of young black and Hispanic children in single-parent families had low relative incomes. Although living in a married-couple family generally improves the chances of having higher relative income, many young children in married-couple homes are in the lowest income tier: two in ten white children, three in ten black children, and four in ten Hispanic children. If the future lies in our children, then these income disparities indicate an uphill climb for many of our nation's youth.

Demographic factors suggest a slower pace of change in family patterns during the 1990s.

Outlook for the American Family

The American family is like a patchwork quilt—composed of many patterns yet durable and enduring even when it becomes frayed around the edges. Despite the diversity and fragmentation of family patterns that have emerged over the past 40 years, most Americans continue to regard the family as a central component of their life. They may no longer live in the seemingly well-ordered family world of the 1950s, but they are struggling to understand and adapt to the new realities of family life.

Making predictions about the future course of the American family is a hazardous business. The scope and magnitude of change in our marriage, divorce, and childbearing patterns have been enormous, making a total reversal of these trends seem unlikely. Yet assuming that future change will continue at the same rapid pace witnessed over the past 20 or 30 years is also an unlikely scenario. While most people will marry and continue to regard the two-parent family as the preferred norm, considerable variation will exist, depending on social and economic conditions.

In the short run, demographic factors suggest a slower pace of change in family patterns during the 1990s. The baby-boom generation, the largest generation in U.S. history, is in the prime childbearing/childrearing ages. For the next ten years, there is likely to be little change in the overall share of families with children. But the composition of those families—whether single-parent, blended, multigenerational, or intact nuclear families—is likely to shift and change with time. Although we know that single-parent families are at greatest risk of living in disadvantaged situations, we have relatively little knowledge of the step- or blended-family model. Because divorce and remarriage rates continue to be at relatively high levels, these reconstituted families are (and will continue to be) a dominant force in the life of many children. What is more, we need to understand how these families function in regard to older relatives: will members of stepfamilies feel the same sense of responsibility and obligation toward assisting older relatives as individuals who grew up in intact nuclear families. The answer to this question is likely to shape our public policy options and strategies.

In the long run, as we move into the 21st century, two demographic trends will strongly influence the structure of American family life. First, the aging of the population—that is, the continued growth in the size and share of the older population—will increase both the number of households without children and the number of persons who live alone. This trend may raise concern over public commitment toward school bond referenda or other public expenditures for children's programs. On the other hand, an increasing number of frail elderly who live alone will require more supportive services in an era when adult daughters hold jobs and are not as readily available as earlier generations to be caregivers. The political struggle over the allocation of scarce resources will almost inevitably be seen in terms of generational conflict and trade-offs. But a better understanding of the mutual supports and interdependencies that extend beyond the nuclear family will be a key part of meeting this challenge.

Second, the U.S. minority population is large and growing, and this fact places a special spotlight on children in need. By the year 2000, one in three school-age children will be from a minority population, compared with about one in four today. Child poverty rates, however, are two to three times higher for minority children than for non-Hispanic whites, and minority children are at greater risk of growing up in disadvantaged circumstances. Neglecting the needs of the next generation can only undercut America's investment in its own economic future.

Valuing the family should not be confused with valuing a particular family form. Indeed, family life in the 1990s will be marked by its diversity. As blended families become the norm, the responsibilities of family members become more complex, more ambiguous, and more open to dispute. Social legislation (or "pro-family" policies) narrowly designed to reinforce only one model of the American family is likely to be shortsighted and have the unintended consequence of weakening, rather than strengthening, family ties. Recognizing the diversity of American families and addressing the complexity of their needs must lie at the heart of the policy debates on family issues.

Jaana Myllyluoma

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Discussion Questions

1. Discuss changes in family structure since the 1960s. What factors drive these changes?
2. Examine age at marriage and patterns of divorce for three generations in your family. How well do they follow the patterns found in the U.S. population as a whole? Explain.
3. Assess the implications of granting "family" status to unmarried couples?
4. Given the authors' explanations for the rise and fall of marriage rates, discuss the prospects for age at first marriage for men and women in the United States in the 1990s. Will age at first marriage continue to increase or begin to decrease?
5. Compare marriage, divorce, remarriage, and childbearing patterns among industrialized nations. Do you think that the U.S. patterns will become more (or less) like other countries in the future? Why?
6. Briefly outline the differences in family formation patterns among racial and ethnic groups in the United States. How might these differences affect future population growth?
7. Consider the "traditional" family model—father as breadwinner, mother as homemaker, two or more children. With this in mind, research family structures and the roles of family members in the United States over the past 200 years. How well does the historical U.S. family fit the "traditional" model?
8. Discuss how changes in family structure, women's labor-force participation, and marriage patterns affect the well-being of children. What other factors affect children's well-being?
9. The authors find that many African-American grandparents play an important role in rearing their grandchildren. What factors may contribute to this role?
10. If you were considering getting married, how willing would you be to marry: someone of another race? someone whose income was considerably less (or considerably more) than your own? someone who was not likely to hold a steady job?
11. How will the aging of America affect family patterns in the United States? What do you see as the major challenges? What would you recommend to meet these challenges?

Prepared by Kimberly A. Crews

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